IDG .net

Comdex: Wireless connectivity makes waves. PAGES 6-7

ICANN can't sidestep DNS vulnerability. PAGE 12

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KNOWLEDGE CENTER SPECIAL REPORT

Sleepy No More

Quick Link

Check out the following stories in our online Knowledge Center on Server Operating Systems

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■ User tips for deploying Windows 2000's Active Directory ■ The prognosis for six flavors of Unix ■ What Linux needs to do to compete with Windows ■ How to choose the Windows 2000 Server version that's right for you

SERVER OS **This is your wake-up call.** Linux is rising. Windows 2000 is being deployed. Windows .Net Server is on the horizon. And IBM's z/OS is shaking up mainframe software pricing. Who'd have thought the once-sleepy world of server operating systems could become so interesting?

Special Report begins on page 27.

USERS BLAST HP SERVER PHASEOUT

Plan to drop e3000 stuns IT managers

BY LEE COPELAND

Hewlett-Packard Co. last week dropped the hammer on users of its HP e3000 systems, disclosing plans to stop selling the decades-old computer line in two years and to cease support at the end of 2006.

The future of the HP e3000 has long been a source of concern for its large installed base. But HP's move still stunned and angered many IT managers, who said they have built their corporate back-end computing environments, and staked their careers, on the venerable midrange system.

John Burke, systems and operations manager at Pacific Coast Building Products Inc. in Sacramento, Calif., said the phaseout plan is especially hard to swallow because HP laid out a five-year development road map for the HP e3000 at a conference sponsored by the independent Interex user group in August.

"I feel betrayed, because I left the HP World conference with a renewed feeling of confidence that the platform would be around," Burke said. "How can we trust HP?"

"I'm appalled and disappointed, and there are lots of unhappy people who see their livelihood threatened by this decision," said John Penney, a systems programmer for the Pierce County, Wash., government. "The HP that we all grew to know and love in the '70s

HP e3000, page 57

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CRUISE LINE'S IT PLANS STRANDED

Sept. 11 fallout leaves $180M project adrift

BY JAIKUMAR VIJAYAN

Until recently, Thomas Murphy's main task as CIO at Royal Caribbean Cruises Ltd. was to oversee the implementation of a massive $180 million project to rebuild the company's core IT systems.

Then came Sept. 11.

Barely three days later, Royal Caribbean's Project Leapfrog was indefinitely shelved, and most development work was frozen midstream. Nearly 50% of the company's IT employees were laid off, and the remaining Leapfrog workers were reassigned to other projects.

Instead of rolling out the new reservation, guest and supply chain systems that had been scheduled for next year, Murphy and his decimated team have hunkered down to the task of coaxing the most out of the existing and almost maxed-out infrastructure.

"To take the whole thing apart so quickly when we were executing on all cylinders was probably the worst thing I had to endure," he said.

"It really tested every ounce of leadership skills that I had," said Murphy, who after two years of championing the project found himself on a six-member executive team that

Royal Caribbean, page 16

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Fig. 1. iSeries Value Proposition.

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Fig. 2. Happy CFO.

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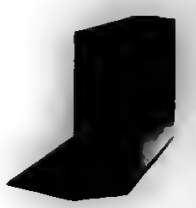

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7 Mobile phone suppliers team op at Comdex and make an end run around Microsoft to develop software for third-generation services.

8 Research conducted by *Computerworld* and J.P. Morgan Securities finds that 10% of 2002 IT budgets will be spent on security.

10 Corporations take steps to documeot their activities and chronicle their histories by archiving their Web sites.

12 ICANN's annual meeting focuses oo beefing up the security of the Domain Name System, tbe Internet's addressing mechanism.

16 More than 900 users have gone live with the latest release of Oracle's business applications, but others have stability concerns.

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Net Protection

Start-up Niksun Inc.'s security monitoring and surveillance appliances provide early warning of denial-of-service attacks while gathering forensic evidence for prosecution.
www.computerworld.com/q?24846

No Regrets

Some may worry that criminals use encryption for nefarious purposes, but PGP creator Philip Zimmermann doesn't regret his invention.
www.computerworld.com/security

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www.computerworld.com/q?q4000

KNOWLEDGE CENTER SPECIAL REPORT

27 Sleepy No More

These are exciting times in the server operating systems market. Linux is rising. Windows 2000 is being deployed. .Net Server is on the horizon. And IBM's z/OS is shaking up mainframe software pricing. Because your choices are so critical to business operations, we offer this collection of stories to help you navigate the changes.

28 Should You Make the Leap?

Windows .Net Server, the forthcoming upgrade to the Windows server operating system family, may not make sense for some companies because the improvements are so incremental. We provide a sneak preview so you can do a feature-by-feature analysis.

ONLINE: A Microsoft executive reveals the strategic direction — with code names! — of the vendor's server operating systems product line. www.computerworld.com/q?24780

32 Servers for Every Season

Which operating system is right for you? It depends oo your budget and the size of your operation. We offer snapshots of the three server versions of Windows 2000.

ONLINE: More tips on how to pick the appropriate version of Windows 2000 for your business.
www.computerworld.com/q?24542

34 Slow Road to Active Directory

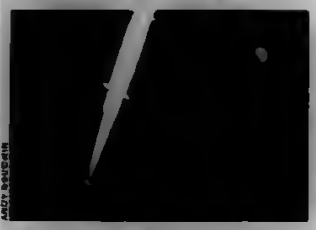
Users who have been through a migration to Windows 2000's Active Directory say bringing in experienced consultants and giving yourself plenty of time are critical.

ONLINE: Seven practical tips from pioneering users for your migration to Active Directory.
www.computerworld.com/q?24698

38 How to Lock Down Windows 2000

To make Windows 2000 Server secure, administrators are building shields around administrative accounts and staying up-to-date with patches. What they're not doing is installing it right out of the box.

40 IBM: z/OS Users Expect Big Savings



ANDY BOUDREAU

IBM's z/OS promises lower software costs, support for open applications and the best of the mainframe world. User Dan Kaberon (above) expects "stupendous savings."

DEAN ABRAMSON

44 Managing OS Diversity

IT departments are faced with maintaining a wide variety of server operating systems, especially with the rise of Linux. But it's a manageable problem for server architects like Curt Allen (above).

49 Need a Linux Diploma?

Certification is a nice bonus, but it's not a must-have in the job market.

50 The Source Is Everything

Columnist Nicholas Petreley predicts that Linux will eventually become the foundation of nearly every enterprise system. Why? Your investment in Linux is protected by the best software warranty on earth.

Also in This Week's Knowledge Center:

43 Kevin Fogarty says users are moving onto the next big thing: Web services.

46 QuickStudy: Explaining the Linux phenomenon.

46 Case Study: Cendant picks a Linux application for its 6,400 hotels.

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The State Of Linux

Red Hat's chief technology officer has strong views on what Linux needs to continue to grow and how it can compete with Microsoft Windows.
www.computerworld.com/q?24541

Vital Signs for Unix

InfoWorld's Test Center evaluates five commercial variants of Unix to figure out which ones are healthy and which ones are in critical condition.
www.computerworld.com/q?24708

What's Ahead for Active Directory

Microsoft official Jackson Shaw answers questions about Active Directory's strengths, limitations and future with .Net Server.
www.computerworld.com/q?24864

AT DEADLINE

Dow Chemical, IBM In Web Hosting Deal

The Dow Chemical Co. and IBM signed a five-year deal that calls for IBM to provide Web-site development, testing and hosting services for Dow. The agreement covers Dow's corporate Web site as well as an extranet and other customer-facing sites operated by the Midland, Mich.-based company. IBM will also update Dow's Web servers three years into the deal. Financial terms weren't disclosed.

GM to Bring Online Unit Back Into Fold

General Motors Corp. disclosed plans to fold its e-GM online business unit back into its regular corporate operations during the next 12 months. GM, which formed the e-GM unit two years ago, also said it's scrapping plans announced last year to set up a joint venture with its dealers for building an informational Web site aimed at car buyers.

FTC Seeks More Info From HP, Compaq

The Federal Trade Commission (FTC) asked for more information on Hewlett-Packard Co.'s proposed acquisition of Compaq Computer Corp., according to documents that HP filed with the Securities and Exchange Commission. HP described the request as "routine and expected." However, an FTC spokesman said that while such requests aren't unusual, they aren't a standard action by the commission.

Short Takes

IBM doubled the storage capacity of its high-end Enterprise Storage Server disk arrays, known informally as the Shark line, to 22TB by adding new 72.8GB disk drives. . . . The U.S. SENATE approved a two-year moratorium on new Internet taxes after tabling a proposal related to state-level online sales taxes.

Tablet PCs Inspire Business Use Hopes

Comdex attendees see potential benefits for mobile workers and even technophobes

BY CAROL SLIWA
LAS VEGAS

MICROSOFT Corp. Chairman and Chief Software Architect Bill Gates promoted the Tablet PC during his Comdex keynote address for the second straight year — even though the machines aren't expected to ship for another year and their specifications are still in flux.

Yet IT professionals have already begun to envisioo ways their companies might beoefit from the notepadlike, wireless-enabled, fully functioning PCs, which can be used with keyboards or pens and "digital ink." More than 70% of 15 randomly polled Comdex attendees said their firms may consider buying some Tablet PCs when they hit the market.

"Depending on how the manufacturers configure the hardware, this could be a logical next step in our business," said Harold Knowlton, CIO at Devon, Pa.-based Prudential Fox & Roach Realtors, which has about 900 employees and 3,500 independent agents. He said the Tablet PC could boost agents' ability to serve customers in the field.

Knowlton said that he has been scoping out wireless personal digital assistants (PDA) but users would prefer standard PC-type functions rather than the customized subset they get with PDAs. Plus, his firm can go wireless without having to rewrite its Web applications, Knowlton said.

Master Sgt. Brian Hill, a network manager at Hill Air Force Base in Utah, said his squadron is experimenting with wireless networked Pocket PCs for mobility in responding to calls for IT support. But he said he would prefer a Tablet PC for the extra screen space.

"In my workstation back at my desk, I have multiple windows open," Hill said. "If I can have tbat and carry it along with me, that's a plus."

Gary Steinkamp, president of Phoenix-based The Health Source Inc., which sells software and computers to doctors, small clinics and hospitals, said he's seeing huge interest in Tablet PCs from health care professionals. "In my industry, electronic medical records are now the buzz," he said. "They want to get to an electronic, paperless office."

FUJITSU'S Tablet PC is one product promising new mobility.

Doctors want to be able to jot down patient notes at their offices or at the hospital and not have to re-enter the informatioo into their computers, Steinkamp said. They also want to be able to take their computers home and access the network to view medical records wheo they're on call, he added.

Ellen Bristow, IT director for the 540-person San Juan County government in Aztec, N.M., said the Tablet PC is appealing as a tool for those commissioners who "aren't real computer-literate."

"I think it would be real beneficial to them to be able to sit and take notes instead of typing," Bristow said.

Dan North, a webmaster at Frederick's of Hollywood Inc., said Tablet PCs may help bridge the gap for the Hollywood-based retailer's district managers, many of whom are "technophobes." But even he would like to be able to draw charts into a document. "That's next to impossible in [Microsoft] Word. If I can just scribble it out, my life's a lot easier," North said.

Equipped with a special edition of Windows XP, the Tablet PCs will have the ability to transform handwriting into typed text, making it searchable, Microsoft officials said. They will also be able to store notes just the way a person wrote them, using what Microsoft calls digital ink, which makes it possible to move or highlight handwritten words. Windows XP-equipped Tablet PCs will also have speech-recognition capabilities, so recorded audio can be changed to text.

Luther Marcena, program manager for the Advanced Technology Center at El Paso Community College in Texas, said he can envision students exchanging handwritten, audio-recorded or videotaped notes via infrared transfer. "It's the next step," he said. "It will promote collaboration among the students, which we're trying to do anyway."

Rodger Soper, who works in information services at Disney Worldwide Services Inc. in Burbank, Calif., said he sees the Tablet PC as a productivity tool. He said he was pleased that Microsoft last week announced plans to extend Office XP to the Tablet PC. "That's going to make it really work," Soper said.

Or Maybe Not

Not everyone is convinced of the merits or future success of the Tablet PCs that Microsoft and its hardware partners promoted last week at Comdex.

David Bailey, a research analyst at Gerard Klauer Mattison & Co., an investment bank in New York, said he foresees limited potential for the Tablet PC at his firm. "A lot of people are just trying to get more productivity out of the PCs that they have," he said.

"People keep trying to wring more uses out of the old form factors, the old PCs. I'm somewhat skeptical about their ability to really drive into new markets at this point," Bailey said. "A lot of these ideas have been around for a long time. IBM had a tablet PC, the WordPad, out several years ago with limited success."

Thomas Wigginton, director of IT for the North American Mission Board of the Southern Baptist Convention Inc. in Alpharetta, Ga., said the Tablet PCs will be viewed as too big by his mobile users, who want small devices to check e-mail or view and project PowerPoint presentations.

Paul Nealon, a decision support analyst at Computer Bookshops Ltd. in Birmingham, England, said his firm's sales representatives already use limited-function tablets. But, Nealon said, his firm probably can't justify a $2,000 notepad.

Tom Sabatino, a consultant at T.C. Rose Co., a computer sales and service firm in North Tonawanda, N.Y., said he doesn't expect to see Fortune 500 companies make any giant leaps to the Tablet PC.

"You can't just dump a new product into a corporate structure without bringing the whole corporation upward, and for many corporations, that's too costly," Sabatino said. The Tablet PC, however, might being useful for certain employees in limited areas, he said.

– Carol Sliwa

Quick Link For more information on Tablet PC models under development, visit our Web site.
www.computerworld.com/q?25158

Nokia, Rivals Team Up to Develop 3G Service Apps

Group shuns Microsoft's .Net initiative

BY BOB BREWIN
LAS VEGAS

The world's leading mobile phone manufacturers and operators, led by Espoo, Finland-based Nokia Corp., plan to jointly develop software for advanced digital services for mobile Internet users. The initiative is seen as an end run around any move by Microsoft Corp. to dominate a market that has more than 1 billion users around the world.

Microsoft appeared blindsided by the move toward a global alliance, with executives complaining that they hadn't been invited to join even though the company has development deals with some of Nokia's partners, including an agreement to produce a combined Pocket PC and mobile phone for U.K.-based MmO2 PLC.

"The phone guys are dedicated to [keeping] Microsoft out of the party," said Ken Dulaney, an analyst at Gartner Inc. in Stamford, Conn.

"Is this initiative any good?" Dulaney asked. "Well, it would be nice if it had a name, [and] that tells you something about the marketing prowess behind it. It's ton grand to be assured of success. [It's] not well structured at this point. But Nokia is behind it, and that is enough."

Nokia will license its crown jewels — source code to control such functions as mobile Web browsing and the highly popular Short Messaging Service software — to the still-unnamed venture, Jorma Ollila, Nokia's chairman and CEO, said in a keynote speech at the Comdex/Fall 2001 trade show here.

The consortium's goal is to develop software so any mobile user can tap into an advanced suite of third-generation (3G) mobile software services anywhere in the world. That's currently impossible due to a hodgepodge of proprietary systems, said Pertti Korhonen, Nokia's senior vice president for mobile software.

Ed Suwanjindar, product manager for Microsoft's Mobility Group, said the mobile phone consortium is developing a "shadow universe" that ignores the work Microsoft has done with its .Net strategy to bring Internet services to any device operating anywhere.

.Net is built on open standards, he said, adding that if Nokia and its partners want to bring the mobile and Internet worlds together, "they need to have someone with the Internet expertise."

Welcome - On One Condition

Korhonen said the mobile consortium would welcome Microsoft as a partner on one key condition: The company must "contribute on an open-source-code basis."

Suwanjindar didn't directly address the questions of whether Microsoft would join the group or contribute its source code. He said only that the company is "still waiting to learn more details about the consortium before making any big move."

Global Mobile 3G Software Consortium

HARDWARE AND SOFTWARE VENDORS	NETWORK OPERATORS
Fujitsu, Nokia, Matsushita,	AT&T Wireless
Mitsubishi, Motorola, NEC,	Cingular Wireless
Samsung Electronics, Sharp,	MmO2 (England)
Siemens, Sony Ericsson,	NTT DoCoMo (Japan)
Symbian, Toshiba	Vodafone Group (England)

Besides Nokia's source-code contribution, the consortium plans to build software to deliver 3G mobile services based on Sun Microsystems Inc.'s Java and a mobile operating system developed by Symbian Ltd. London-based Symbian is a partnership of handset manufacturers that includes Nokia, Motorola Inc., LM Ericsson Telephone Co. and Matsushita Electric Industrial Co.

For Microsoft, Dulaney said, there are "no harsher words" than *Java* and *Symbian*.

The key mobile software components that the consortium plans to work on will initially include multimedia messaging, digital rights management for mobile use of music and video, subscriber authentication and XHTML for Web browsing, said Korhonen. He declined to predict when the standard software would be delivered to its members but said some of it could be out in less than a year.

Korhonen called the authentication software "an extremely important part" of the joint development efforts because it could help jump-start mobile e-commerce, which in turn could provide money to help finance the multibillion-dollar cost of 3G licenses and network development. ▶

AT A GLANCE

Special Delivery

The global mobile network consortium expects to begin delivering software in less than a year. Its initial development targets include the following:

- Subscriber authentication to enable mobile commerce
- Multimedia messaging
- Digital rights management
- XHMTL for Web browsing

SOURCE: NOKIA CORP., ESPOO, FINLAND

Staples CIO Warns IT to Resist Innovation 'Frenzy'

Cites other goals ahead of upgrading

BY MARK HALL
LAS VEGAS

In sharp contrast to the uninhibited hawking of cutting-edge technology on the Comdex show floor, Staples Inc. CIO Brian Light cautioned IT users here to "get back to basics" when considering future technology purchases.

The top IT executive at the $11 billion Framingham, Mass.-based office supply retailer said in a keynote speech that companies should "resist the frenzy of innovation" because it can frustrate strategic IT goals such as usability and return on investment.

Light pointed specifically to Windows XP, one of the most visible new technologies at the conference. He said companies should critically evaluate the costs and timing of upgrading to Microsoft Corp.'s new operating system before making the jump. He noted that Microsoft's own recommendations for Windows XP call for PCs that have 128MB of memory and 1.5GB of free disk space. In comparison, Windows 98, the most common corporate PC client, needs only 24MB of RAM and 205MB of available disk capacity.

"WE WANT TO BE a fast follower," says Brian Light, Staples CIO.

Light told *Computerworld* that Staples is planning to upgrade to Windows XP in 2003, skipping the Windows 2000 client. But even after waiting two years to make the switch, it will still cost Staples "tens of millions of dollars" when it upgrades to XP, he said.

He said the company's strategy is to link the operating system upgrade to the availability of a key supply chain application, which won't be ready with its XP client until 2003.

"We want to be a fast follower," Light said. "You don't need to be a leader in a new back-end management system."

Web applications represent the one exception to Light's warning on innovation. Because the pace of change is so quick in online technology, choosing best-of-breed software is important, he said.

For example, Staples uses outbound e-mail software from Menlo Park, Calif.-based Kana Software Inc. However, Light said, it's wise "not to make the software cancerous by having it reach too deep into your back-end application." By using a messaging architecture that lets Web-based software interact on a transaction basis with other applications, users can easily swap the online software for another package, he said.

The company's Staples.com unit has been growing rapidly since it began taking orders online in 1999. The business is on target to double its growth to $1 billion this year.

Staples' in-store kiosks have contributed to the success of its Web business, Light said. They're also a good example of integrating advanced Web technology with established point-of-sale systems, thus helping expand sales while holding down back-end system management costs, he added. ▶

Quick Link For more news about the Comdex trade show, visit our special focus page.
www.computerworld.com/q?id290

THE PAPER AND INK USED IN THE ORIGINAL PUBLICATION MAY AFFECT THE QUALITY OF THE MICROFORM EDITION

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He said the company's strategy is to link the operating system upgrade to the availability of a key supply chain application, which won't be ready with its XP client until 2003.

"We want to be a fast follower," Light said. "You don't need to be a leader in a new back-end management system."

Web applications represent the one exception to Light's warning on innovation. Because the pace of change is so quick in online technology, choosing best-of-breed software is important, he said.

For example, Staples uses outbound e-mail software from Menlo Park, Calif.-based Kana Software Inc. However, Light said, it's wise "not to make the software cancerous by having it reach too deep into your back-end application." By using a messaging architecture that lets Web-based software interact on a transaction basis with other applications, users can easily swap the online software for another package, he said.

The company's Staples.com unit has been growing rapidly since it began taking orders online in 1999. The business is on target to double its growth to $1 billion this year.

Staples' in-store kiosks have contributed to the success of its Web business, Light said. They're also a good example of integrating advanced Web technology with established point-of-sale systems, thus helping expand sales while holding down back-end system management costs, he added.

Quick Link For more news about the Comdex trade show, visit our special focus page.
www.computerworld.com/q?a0280

Survey: Security Technology Gets Bigger Slice of IT Budgets

Corporations plan spending increases in response to September's terrorist attacks

BY JULIA KING

THE SEPT. 11 attacks on the U.S. and continued fears of cyberterrorism are pushing many companies to include more money for security technologies in their 2002 IT budgets, according to the results of a survey conducted last month by *Computerworld* and J.P. Morgan Securities Inc.

Of the 174 IT managers polled online during the last two weeks of October, 53% said they expect to devote a higher proportion of their total IT budgets to security next year than they did this year. Only 5% said they expect their security spending to decline.

Companies with annual revenues of more than $500 million are expected to spend the most on security next year, according to the survey. Respondents in that category said security-related investments will account for 11.2% of their total IT budgets on average, compared with an average of 10.3% for all the users who responded.

Both figures are well above the 7.4% of their budgets on average that the surveyed companies set aside for security spending in this year's IT budgets. Secure Sockets Layer products, antivirus and intrusion-detection software, virtual private networks and firewalls top the list of new technologies respondents said they plan to deploy next year (see chart).

What's particularly notable is that companies are beefing up security spending even though their total IT budgers are decreasing or remaining flat. More than half (59%) of the survey participants said they expect their overall IT spending to decline next year or be similar to this year's levels.

But since the terrorist attacks, many IT managers have noted that it's far easier to get money budgeted for security than in years past.

"Right now, I don't have to justify any expenditure effort on IT security," said Ralpb Menzano, CIO at the Southeastern Pennsylvania Transportation Authority in Philadelphia, during a recent roundtable discussion about return on investment in IT. Among other measures, he said, the transportation agency is considering implementing a biometric security system to verify employee identities.

Curtis Robb, chief technology officer at Atlanta-based Delta Technology Inc., said the IT arm of Atlanta-based Delta Air Lines Inc. is also expanding its focus on security initiatives as a result of the terrorist attacks. "One of the things we're doing is updating the infrastructure in 75 of our largest airports to include the latest network security gear," Robb said.

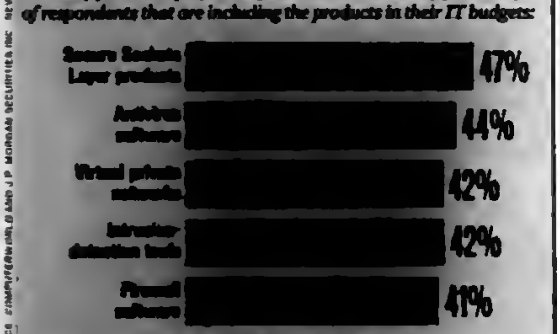
He added that biometrics could also play a major role, both for verifying the identity of employees and "as a way of getting [passengers] we know through the lines faster."

Despite the interest that users such as Menzano and Robb have in biometrics, only 4% of the survey's respondents said they plan to deploy such systems next year. Also absent from the top spots on the list of security technologies participants are eyeing were user authentication tools such as smart cards and public-key infrastructure products.

Analysts at New York-based J.P. Morgan said one reason may he that authentication systems typically start at more than $100,000. Those prices may be too steep in today's economic climate, they noted.

Spending Plan

Here are the top five security technologies that surveyed companies said they plan to deploy during the next 12 months, by percentage of respondents that are including the products in their IT budgets:



SOURCES: COMPUTERWORLD AND J.P. MORGAN SECURITIES INC., NEW YORK

Note: 181 IT managers surveyed last month; multiple responses allowed

Group Pushes Standards For Vulnerability Disclosure

Vendors lead effort to delay reporting of security exploits

BY JAIKUMAR VIJAYAN

Microsoft Corp. and a handful of security firms have formed an alliance to propose standards that would give vendors time to fix security flaws in their software before those vulnerabilities are publicly disclosed.

The as-yet-unnamed group was formed at Microsoft's recent Trusted Computing Conference. Its goal is to create consensus and standards regarding the disclosure of security flaws and information on how to exploit them, said Eddie Schwartz, an analyst at Guardent Inc. in Waltham, Mass. Guardent is one of five security firms to join the effort.

"We want to create an atmosphere where people are more responsible with the disclosure of vulnerability information," Schwartz said. "Right now, it is way too ad hoc."

The tendency to indiscriminately publish information on how to exploit software flaws has led to considerable damage in the past, he said. The aim of the group isn't to stifle the disclosure of vulnerability information, but to prevent such information from being prematurely published, Schwartz said.

Under one proposed guideline, people who find a software flaw would wait at least 30 days before releasing details on how to exploit it. Software vendors would use that period to develop and distribnte patches to customers. The guidelines would be voluntary, since the group has no enforcement authority.

The group said it will also work to ensure that vendors respond in a responsible and expeditious manner when providing information about a security flaw.

The effort comes just a few weeks after a Microsoft security manager published a scathing document on the company's Web site lashing out at the "information anarchy" that currently exists with respect to vulnerability disclosures.

But some users are less than enthusiastic about the alliance's efforts. "Quite frankly, I think the 30-day grace period is just another way for Microsoft and others to once again remove themselves from their responsibility for developing quality software before it hits the streets," said John Cowan Jr., an IT manager at Louisville, Ky.-based Caldwell Industries Inc., in an e-mail.

A 30-day moratorium on vulnerability disclosure wouldn't be good for business customers or the consuming public, said Lowell T. Byrd, a vice president at The Insight Group, a Lewes, Del.-based health care and high-tech management consulting firm.

"I would much rather see the vulnerability information remain in the free market so that the good guys can work on protecting themselves even while the bad guys continue their exploitation," he said.

Proceeding With Caution

Microsoft has aligned with these five security firms in a bid to develop and promote a standard framework for the public disclosure of security vulnerabilities:

Get *sky-high* backup and recovery performance with

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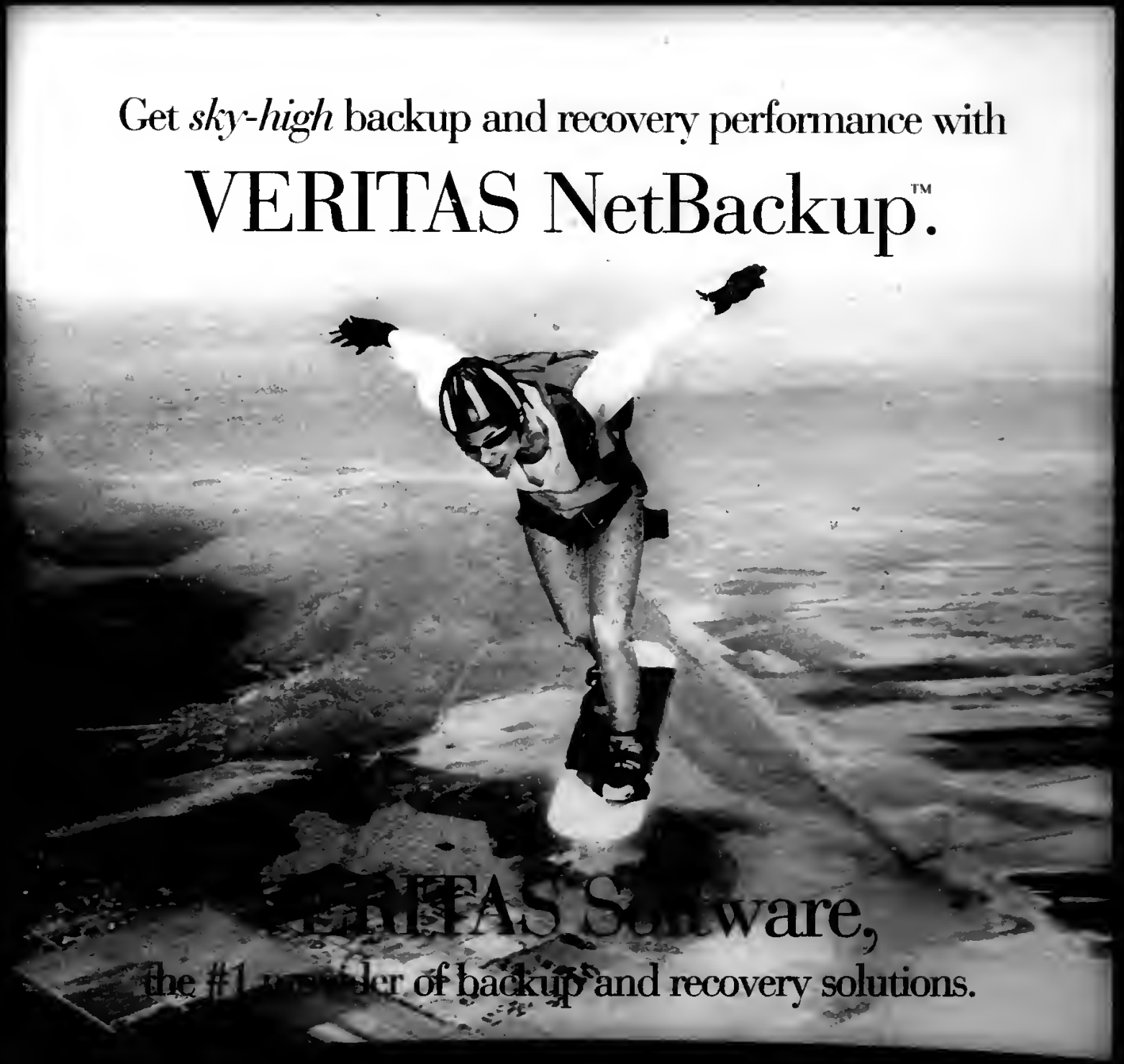

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VERITAS

Lost in Cyberspace

Corporate archivists look to save digital records, after early Web sites vanished

BY TODD R. WEISS

LIBRARIANS and archivists have been saving artifacts, newspapers, photographs and books for years to preserve historical records. Today, their work is made even more complicated because so much of our unfolding history is chronicled on the Internet.

That has meant changes to archiving procedures, including decisions over what electronic information should be saved and how to store it.

According to Elizabeth Adkins, global information manager at Ford Motor Co., "There is a general recognition in the archival profession that people want to do this, but technology hasn't caught up yet."

These issues also affect businesses, Adkins and others pointed out. But in many cases, they said, companies haven't been paying close attention to their own digital histories. Although large, established companies have for years saved much of their past on paper, it's unclear whether they have been as thorough with their first forays on the Web.

"There's a whole lot that's come and gone," said Carol Baroudi, owner of research firm Baroudi and Associates in Arlington, Mass.

Some companies have made progress. Amy Fischer, corporate archivist at Procter & Gamble Co., said the Cincinnati-based consumer products maker has been saving digital records since it started its first Web site in 1994.

But there has been no archiving road map, she said, and much of what has been done was by trial and error. "There's been a lot of handwringing in the business archive community," Fischer said.

For Posterity

Procter & Gamble, established in 1837 as a small, family-operated soap and candle business, has for years collected and archived its printed ads for products ranging from Ivory soap to Pepto-Bismol. "It makes sense that we save the electronic stuff, too," Fischer said.

The company saved its earliest Web sites only on paper printouts because no one knew how to save them digitally at the time, she said. Now all of the company's Web and intranet sites are archived electronically to maintain a link to the company's past.

"Not everyone is doing it," Fischer said of other companies. "But by now, most people are aware that they need to be doing it."

Adkins said Ford is getting there. Several years ago, the company began looking at what to do about its digital history. Next year, it will begin a formal archive using Portable Document Format files created with Adobe Acrobat software, she said.

Ford's first Web site was launched in 1995, but neither that version nor the updates that followed were ever officially saved, she said.

"The Internet is a tool that's designed for moving a business forward, and the people involved don't necessarily think of the ground they're breaking," Adkins said. "People are more caught up in getting the job done than about preserving their efforts."

BMC, HP Release Tools for Monitoring Hosted Apps

Designed to help ASPs ensure user performance levels

BY MICHAEL MEEHAN

With the proliferation of hosted applications, systems management vendors are targeting application service providers (ASP) with new tools designed to allow for better monitoring of the systems they run for corporate users.

BMC Software Inc. last week released a Web-enabled management tool for ASPs that's a lightweight version of its flagship Patrol software. That came a week after Hewlett-Packard Co. added modules for managing hosted Unix, Windows and network infrastructures to its HP OpenView line.

The products are supposed to make it easier for ASPs to monitor the performance of the systems and applications they're managing for corporate clients. According to users and analysts, assuring that quality-of-service promises are met is a critical issue for ASPs.

For example, New York-based Quikbook Inc. runs its discount hotel reservation Web site on a hosted infrastructure based on Microsoft Corp.'s Windows and SQL Server database. Lisa Baez, Quikbook's IT director, said a paramount concern for her is the ability to monitor the servers to ensure uptime.

Quikbook uses a hosted version of BMC's Patrol product to do the job now, but Baez said a Web-enabled tool would save her the cost of network routers used to send the monitoring data and cut down on maintenance fees included in her service-level agreement. "Everything we're doing is Web-enabled," she said. "It would be nice if this was too."

Sue Aldrich, an analyst at Patricia Seybold Group Inc. in Boston, said ASP customers often wind up with systems problems they didn't foresee, once applications begin to shuttle data between their hosted servers and others that run internally. She added that Houston-based BMC's GuardianAngel software for ASPs could be a precursor to next-generation systems management tools aimed at corporate users.

Additional Service

BMC said ASPs will be able to manage systems for multiple users from a single Web portal and sell the monitoring capability as an extra service on top of hosted applications. In turn, users can access real-time performance information and configure the monitoring tool to check specific systems.

According to BMC, corporate users will download a 1.5MB remote monitoring program that runs on Windows servers and will get Linux support early next year (see box).

Aldrich said systems management vendors are inching toward Web-based tools. HP is addressing some of the same ASP usage-monitoring capabilities as BMC, she added. But it's using "a more traditional approach" augmented by a Web-based console.

HOW IT WORKS

Hall Monitor

BMC's new Web-enabled systems monitoring tool for ASPs includes these features:

- A downloadable 1.5MB remote monitoring program tracks the performance of systems and sends encrypted data to a portal at the ASP
- Up to 10,000 different elements can be monitored by each remote program, and a single portal can service up to 1,000 of the programs.
- The software is built on top of BEA Systems Inc.'s WebLogic application server and uses it to manage load balancing and transaction processing.

Sept. 11 Web Site Postings Archived

Last month, the Library of Congress announced it had begun collecting a massive digital record comprising gigabytes of data culled from thousands of news, personal and tribute Web sites related to the Sept. 11 terrorist attacks on the U.S. The project began when a library official realized that if the electronic history of the unfolding events wasn't carefully preserved, it would probably be lost forever.

The official, Diane Kresh, director of public service collections at the Washington-based library, said the agency entered into a $100,000 contract with nonprofit Internet Archive, which has been saving history digitally on its network of servers since 1996. Under the deal, Internet Archive continues to do daily digital captures of Web sites related to the disaster. The archive did a similar project last year for the Library of Congress, creating and maintaining a digital history of the tumultuous U.S. presidential election that included news Web sites and the original campaign sites for both George W. Bush and Al Gore.

Brewster Kahle, CEO of San Francisco-based Internet Archive, said his group has been saving Web pages from approximately 1,900 sites for the Sept. 11 project. The organization's mission is to build a digital library of the Internet, which it's doing with several partner groups. The data is stored using software called a Wayback Machine, which lets users go back to sites and see them as they were when first posted on the Web.

Internet Archive has a total of about 100TB of storage space so far and has currently saved 5TB of information in the Sept. 11 archive, which can be seen at *http://september11.archive.org*.

The goal is to save "material that is here today and gone tomorrow," Kresh said. "This was an event that had a profound influence," she said. "The Internet has become the public commons and has connected people in ways that were unimaginable."

– Todd R. Weiss

Do you have the Big Blues over your IT infrastructure?

With fourteen operating systems, multiple chip architectures and a tangle of middleware to deal with, it's no wonder only IBM can "integrate" their systems. Which means you'll pay – and pay – for their monopoly on service. Because with their closed, complex systems, they control it all.

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Web Addressing System Vulnerable

ICANN looks for ways to improve security

BY PATRICK THIBODEAU
MARINA DEL REY, CALIF.

SOMEONE WAS "sniffing" passwords sent over a wireless network used at the Internet Corporation for Assigned Names and Numbers (ICANN) meeting last week and giving them to Randy Bush, a researcher at AT&T Corp. Bush then shared several of them over the conference's public-address system.

Despite the warnings emblazoned on conference badges about transmitting unencrypted passwords, some attendees at the ICANN conference here weren't getting the message. And security should have been uppermost in their minds: The conference was held to examine the security of the Domain Name System (DNS), the Internet addressing system that makes online commerce and communications possible.

"It means there are idiots here," Bush said later. "They don't know how to change the password. They have IT departments back home that control their lives. The root problem is their IT department."

Bush's point underscored one of the problems in protecting data. ICANN's most important task is to ensure the stability of the DNS. And the message at the annual meeting of the nonprofit group was that there are vulnerabilities in the DNS.

Points of weakness include the DNS's recognized vulnerability to distributed denial-of-service attacks. Another is its heavy reliance on Berkeley Internet Name Domain (BIND) code, which is freely distributed by the Internet Software Consortium, a nonprofit group in Redwood City, Calif., that develops open-source products.

BIND runs several of the domain servers, including primary or zone servers that handle addresses for .com as well as other top-level domains. It is also used for local name servers, such as those Fortune 1,000 firms might use.

The Code That BINDs

The most important part of the hierarchical DNS are the 13 root name servers, which constitute a redundant system in locations around the world.

"Virtually all the name server software is derived from one code base — BIND," said Steven Bellovin, an AT&T fellow. Although BIND has since been rewritten to two code bases, "that's not a lot," he said. "If there is a fatal flaw in the two main implementations of BIND, we would lose all 13 name servers to just two bugs."

But the root name servers are protected to a degree by their geographic dispersion. "The physical security of the computers is the least worry," said Lars-Johan Liman, who operates a root name server in Stockholm.

ICANN's role with respect to security is limited. But Vinton Cerf, the organization's chairman and one of the founders of the Internet, is considering several approaches.

One idea is a DNS "cleanup day" to get DNS operators to inspect their systems and do upgrades. Cerf, who is also senior vice president of Internet architecture and technology at WorldCom Inc., said he would like to see ICANN become a venue for development of good management practices. Diversity in the kinds of software that run DNS systems would also be a goal, said Cerf. "The idea of having the same bug kill everybody at the same time is pretty scary," he said.

ICANN's Lynn: Don't Expect New Domains Anytime Soon

Latest names being tested for capability

MARINA DEL REY, CALIF.

At this time last year, the Internet Corporation for Assigned Names and Numbers (ICANN) approved seven new top-level domains (TLD) to compete with the original TLDs. But the organization, which follows a *Star Trek*-like "prime directive" of ensuring the stability of the Internet's Domain Name System (DNS), has no plans to go beyond that. ICANN CEO **Stuart Lynn** explained why in an interview last week with *Computerworld*'s Patrick Thibodeau.

Q: You have limited your introduction of new TLDs to seven – .biz, .info, .name, .pro, .museum, .aero and .coop – and are now running a "proof of concept" to test these new domains. When will you have "proof," and what happens next?

A: *Proof* is a very difficult word in this context. We have a task force that I'm chairing that is coming up with recommendations on how to evaluate the current round of introductions. I suspect that the report of that committee will be a month or two away.

One question is whether, or how, to introduce new TLDs in the future. I don't want you to think that it's a foregone conclusion that we will or that we won't. The board has made no decision on that either way.

As many people as there are who want to see more TLDs, there are also large segments of the community who think we have enough already. The former tend to be very vocal; the latter we hear from as well.

Q: Do new TLDs jeopardize the stability of the DNS?

A: One of the reasons we're doing a proof of concept is to try to answer that question. Scalability in terms of performance is one of the issues that's been raised by the [Internet Engineering Task Force], and we don't know the answer to that because it's been 15 years since major generic TLDs were introduced. We have some learning to do. There are also different kinds of stability, including trademark and cybersquatter issues.

LYNN: We have some learning to do.

Q: If there are no technical impediments to adding top-level domains, would that essentially obligate you to do so?

A: No. We do have other responsibilities in creating a level playing field and a fair place for competition. And if there was any feeling that the consequences of that could destabilize the Net, not just in the area of performance, then we would be concerned about that. On the other hand, we are not going to apply constraints just for their own sake. We're fairly minimalist in trying to create that playing field. We're not a regulatory body; we coordinate a degree of industry self-regulation.

Q: Would you consider usefulness of new TLDs before adding them?

A: If there is no demanding, pressing consumer need that's perceived, then why risk destabilization in other areas?

Challenge to the 'Single Root'

MARINA DEL REY, CALIF.

ICANN's power stems from its authority over the "single root" in the DNS. But some upstart businesses are challenging that power.

New.net Inc. in Sherman Oaks, Calif., is one such firm. The company, which was founded in March and is running on venture capital, has created nearly 90 domain name extensions, including .travel, .shop and many extensions aimed at foreign markets, such as .hola. Those extensions compete with the relatively few ICANN-sanctioned domain name extensions, including the well-known .com, .org and .edu, and the seven recently added top-level domains, including .info.

But because these extensions aren't recognized as part of the authoritative root, the so-called alternate roots must get Internet service providers to recognize them or get users to download software to the client.

These alternative root providers say they're capitalizing on a market demand that ICANN has failed to meet. But ICANN says alternate roots threaten the stability and uniformity of the DNS.

"I consider this to be a great disservice to anyone who is trying to use the Internet," said Vinton Cerf, ICANN's chairman.

The problem could become acute if, for example, ICANN approved its own .golf for the single root and it conflicted with New.net's version. But that's a risk that Steve Chadima, New.net's chief marketing officer, is willing to live with. "They [ICANN] have got to learn that it's not their Internet," he said.

Chadima acknowledged that ICANN's ability to attack his firm's business model through its control of the DNS is perilous. Those uncertain "political risks" are the company's "single biggest challenge in raising money," he said.

– Patrick Thibodeau

Doing five things at once is no big deal to me. Except when four of them don't make my company more profitable. So when the time came to build a new system to move our business forward, I knew it was also time to allow someone else to handle maintaining our existing systems. Was it hard to let that all go? Not really. I work in IT.
JUGGLING
OF MY
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INFORMATION TECHNOLOGY OUTSOURCING
At Fujitsu, we know that profitability is a function of efficiency. So do the IT professionals who choose us for their outsourcing needs. If you'd like to spend less time on things that don't grow your business and more time on the core things that do, we can help. Whether you need us to take over all your IT functions, or manage your existing application portfolio, we bring vast experience in a wide range of industries to every project we manage. Go to us.fujitsu.com/outsourcing/ to learn more about how we can tailor our services for you. When you partner with a global leader in outsourcing services, you can accomplish anything.
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BRIEFS

SunGard Wins Comdisco Unit

Wayne, Pa.-based SunGard Data Systems Inc. bought Comdisco Inc.'s disaster recovery unit for $825 million after a federal judge rejected U.S. Department of Justice claims that the deal would lead to higher prices for users. The unit was the subject of a bidding war between SunGard and Hewlett-Packard Co. as part of Rosemont, Ill.-based Comdisco's bankruptcy proceedings.

DOJ Submits Report On Microsoft Deal

The Justice Department filed a report outlining the expected impact of the antitrust settlement it reached with Microsoft Corp. Among other things, the agency claimed that the deal will give PC makers "freedom to make decisions about distributing and supporting non-Microsoft middleware products without fear of coercion or retaliation by Microsoft."

Dell Shows Revenue, Profit Drop in Q3

Dell Computer Corp. reported a 36% year-over-year drop in profits for its third quarter ended Nov. 2, as revenue fell by 10%. Dell earned $429 million on revenue of $7.5 billion in the quarter, compared with year-earlier totals of $674 million and $8.3 billion, respectively. CEO Michael Dell said fourth-quarter revenue will likely increase slightly from the third-quarter level.

Short Takes

IT budgets will rise by an average of just 1.5% next year, according to a survey of 1,048 IT managers by GARTNER INC. and SOUNDVIEW TECHNOLOGY GROUP INC., both in Stamford, Conn. . . . The CERT COORDINATION CENTER in Pittsburgh warned that a flaw in a Unix graphical user interface could let attackers gain control of servers.

Microsoft Offers B2B Tools for Wary Suppliers

Software/services package designed to help firms connect to procurement systems

BY CAROL SLIWA

SCORES OF SUPPLIERS have been resistant to hopping on the electronic business-to-business bandwagon, fearing that they will be so commoditized or pressured by comparative pricing that they will fail to see much benefit from shelling out potentially big bucks to get there.

Microsoft Corp. aimed to address that problem earlier this month when it announced the availability of what it calls its Solution for Supplier Enablement. The software giant said that the package will make it easier, faster and cheaper for suppliers to connect to their customers' electronic procurement systems and marketplaces.

But whether packages such as the software/services combination Microsoft is offering will drive suppliers to link to marketplaces and procurement systems remains an open question.

Educating Users

"The challenging aspect with Microsoft will be the education of midtier and smaller companies as to what supplier enablement means to them," said Louis Columbus, an analyst at Boston-based AMR Research Inc. Many suppliers also ask, "What's in it for me?" he added. "It's difficult to explain to someone, if they don't feel any pain, that they need some medicine," he said.

The Microsoft software package is largely a collection of existing products, such as the Windows 2000 Server operating system, the SQL Server 2000 database, the BizTalk Server XML messaging and workflow engine, and Commerce Server, which provides personalization and transaction capabilities.

There's also a key new piece of software, called BizTalk Accelerator for Suppliers, that includes adapters that let suppliers connect to systems using the XML formats from Ariba Inc., Commerce One Inc., Clarus Corp. and others.

Additional functions enabled by the Microsoft software stack include the creation of a customized business-to-business Web site, automatic catalog transformation to various XML formats, and remote shopping, which lets buyers punch out from their procurement applications to a supplier's business-to-business site to make a purchase.

But Laurie Orlov, an analyst at Forrester Research Inc. in Cambridge, Mass., said she doubts that Microsoft's "collection of components and capabilities" will have any great impact on supplier adoption. Orlov said procurement vendors such as Ariba need to host the software "with a few more steps in the business process for suppliers and charge very little money for it in order to get the supplier adoption that really makes the procurement applications pay off in ROI."

Microsoft solutions manager Julia White said pricing for Solution for Supplier Enablement starts at $24,000 for the base system for a small company, with consulting services typically tacking on an additional $50,000. A base system for a large enterprise can cost $420,000, with an extra $1 million for consulting services, White said.

Customers can employ consultants to do the work. Microsoft has partnered with several companies, including Accenture Ltd., Cap Gemini Ernst & Young and Compaq Global Services, a spokesman said. ▶

JUST THE FACTS

Key Elements

Components of Microsoft's Solution for Supplier Enablement:

- Windows 2000 Server operating system, SQL Server 2000 database, BizTalk Server 2000, BizTalk Accelerator for Suppliers, Commerce Server
- Detailed architectural and deployment documentation
- Dedicated support personnel with knowledge of all Microsoft products
- Consulting services from Microsoft and partners

Beta Users Back Microsoft's New B2B Package

Some small companies are starting to see the light, when it comes to business-to-business e-commerce - including two beta users of Microsoft's Solution for Supplier Enablement.

Jeff Odom, president of printing products and services vendor TCS Corporate Services in Richardson, Texas, said any concerns he had about the costs of deploying the Microsoft package are being offset by his access to new markets.

Odom said a growing number of his Fortune 500 customers have been asking his firm to interface to the Ariba and Commerce One e-procurement products they have been installing. But he couldn't find a vendor to help for less than $1 million.

"That's just absolutely out of our budget," Odom said, noting that his firm has $15 million in annual revenue and a two-person IT staff.

TCS spent about $50,000 on the Microsoft software licenses and consulting services, which came from a Microsoft partner, Odom said. One of the benefits is that TCS can now publish its catalog, or a customized subset of it, in Ariba's CXML, Commerce One's CBL or any other format.

Odom said his company is already seeing a payoff. One large computer maker recently noticed that TCS had deployed an Ariba catalog and thus included the company in a reverse-auction bid. TCS ended up winning the bid for toner cartridges.

"Usually, you have to scratch and claw for business opportunities, and in this case, this one came to us specifically as a result of our capability to publish [Ariba's] CXML," Odom said.

Once the back office is connected to the output of the sell-side system, TCS expects to see a reduction in transaction costs from $27 per transaction to $6, Odom said. That should save the company $42,000 per month, based on its average of 2,000 transactions per month.

Kevin Govin, chief operating officer at MarkMaster Inc., a Tampa, Fla.-based manufacturer of custom rubber stamps with $7 million in annual sales, said he has been able to reduce his customer service staff from eight to six employees since deploying Microsoft's software package. Govin's company processes 4,000 to 6,000 orders per day, and he said 100 of those are now coming through the new system.

Govin said the Microsoft package was worth implementing because he can leverage it to connect to multiple sites and multiple market engines. "If you were doing it for one customer, [the cost] would be prohibitive," he said.

MarkMaster had eight Fortune 500 customers before installing the Microsoft system. By summer, it expects to have set up 50, Govin said.

– *Carol Sliwa*

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NEW Advanced Desktop Solution
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Recommended upgrades:
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VALUE

Continued from page 1

Royal Caribbean

made the decision to put Leapfrog in cold storage.

"We had to reorganize to meet the needs of the business," he said.

The move by Miami-based Royal Caribbean is one of the more dramatic examples of the slowdown in IT spending in the travel industry following September's terrorist attacks.

"I'm not surprised," said Henry Harteveldt, a travel industry analyst at Cambridge, Mass.-based Forrester Research Inc.

"Companies all over, of all sizes within the travel industry, have been cutting back on their IT budgets, as a result of which all types of projects are getting postponed," he said [Page One, Nov. 12].

"People who wax poetic about the benefits of IT spending and development in the travel industry just don't get it" at a time such as this, said Philip Wolf, an analyst at PhoCusWright Inc., a travel consultancy in Sherman, Conn. "The travel industry is under siege. If there is a penny to be saved, people will do it."

Unexpected

Until the events of Sept. 11, however, there was little to suggest that Project Leapfrog might meet such a fate.

Despite very real concerns about a travel slowdown in the sagging economy, the business benefits from Leapfrog were considered important enough to justify the investment, Murphy said.

Approved by Royal Caribbean's board of directors in May last year, Project Leapfrog's goal was to make fundamental improvements to the company's reservation, supply chain, revenue transaction and customer information systems.

Among a long list of things, when fully implemented, the project would have automated the company's shore-side purchasing processes, allowed Royal Caribbean to capture and reuse customer information more intelligently, provided its ships with real-time access to business-critical information and given travel agents better access to reservation, inventory and scheduling information.

The project involved significant upgrades to Royal Caribbean's hardware, storage networks and middleware, as well as systems management and application software. It would have moved Royal Caribbean away from its core IBM AS/400 RPG development environment to Microsoft Corp.'s .Net architecture. The plan involved an amalgamation of IBM mainframes, Unix servers, AS/400s, Windows NT boxes, storage-area networks and software from a range of companies, including Oracle Corp., J.D. Edwards & Co., Computer Associates International Inc. and PeopleSoft Inc. The idea was to tie it all together using IBM enterprise application integration software and middleware such as MQSeries.

But the travel slowdown caused by the events of Sept. 11, in the midst of an already recessionary economy, "was the straw that broke the camel's back," Murphy said.

When the decision to postpone the project was made, Royal Caribbean had already completed some core aspects of Leapfrog but had to abandon others midstream.

For instance, work on a large shore-side human resources application based on software from Pleasanton, Calif.-based PeopleSoft had already been completed. However, a Web-enabled version that would give Royal Caribbean's ships real-time access to critical information on the training, licensing and backgrounds of thousands of temporary employees worldwide had to be ditched four months shy of rollout. Similarly, the next-generation reservation system had just entered the design phase when the project was shelved.

The number of people in the IT organization was pared from more than 400 to about 225. Many key staffers from Leapfrog have now been reassigned to relatively low-key jobs: For example, a highly skilled project manager now works for a manager supporting an accounting application.

"We took the last month to carefully document all the work that's been done right up to the day it was shut down and put on a shelf," Murphy said. "We want to be in a position to quickly restart [the project]" when things get better, he said.

Some Oracle Users Still Wary About 11i Upgrades

Company's business applications continue to raise stability and support questions

BY MARC L. SONGINI

ORACLE CORP. last week announced that 900 users have now gone live with new business applications released 18 months ago and that a total of 4,000 implementations are in the works. But some IT managers said they're still concerned about software stability and technical support issues.

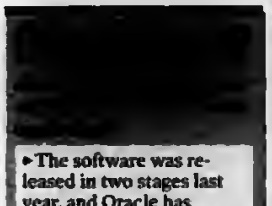
Several existing Oracle users said they're either running behind schedule on upgrades to the E-Business Suite 11i applications or are holding off on projects to give the software more time to mature.

Managing 11i upgrades will be a central topic at next week's fall conference of the independent Oracle Applications Users Group (OAUG). About 40% of the technical sessions scheduled for the conference in San Diego are related to the Web-enabled 11i software, according to an official at the Atlanta-based user group.

An Oracle spokesman said the software vendor believes that the quality and support issues affecting 11i upgrades "are waning." Moreover, Katherine Innes, an analyst at Aberdeen Group Inc. in Boston, said she hasn't seen any evidence that this is a particularly tough upgrade for users in comparison with Oracle's earlier releases or ones from rival vendors.

But one user said an ongoing 11i project has taught him a lesson. "Don't be the first one on the block to install the latest release," said Tracy Innes, an IT manager at the Department of Energy's Sandia National Laboratory in Albuquerque, N.M. "We like the 11i product, but it was grueling to get there."

Jones said Saodia's upgrade from Oracle's older 10.7 applications will take about a year longer than expected to complete because of problems IT staffers found with earlier versions of the software, particularly a self-service procurement module. In addition, he said, Oracle kept changing the technical architecture between different point releases of 11i.



- The software was released in two stages last year, and Oracle has shipped five functionality updates since then.
- 11i has a Web-based user interface, which complicates upgrades for users of older, character-based releases.

Most of the 11i applications went live in July, about four months past the deadline set a year earlier. But software patches needed before the procurement module could be turned on weren't available in time, Jones said. Implementation of that module will now start next month and should be finished by March, he added.

Toronto-based Bank of Montreal completed an upgrade to 11i last May. Steven Pare, e-procurement team leader at the bank, said it encountered "a number of software issues and bugs," but none were critical and they were largely taken care of by software patches. However, Pare said, Oracle's customer service workers too often would recommend installation of the newest patches even if the bug fixes weren't applicable to the issues that the bank was trying to resolve.

Rocky Bertz, the OAUG's treasurer and a project manager at Greenwood Village, Colo.-based CH2M Hill Cos., said he now views the core 11i applications as stable. CH2M Hill, which provides manufacturing and technology project management services, plans to go live with the software next July.

But some users remain wary. For example, the city government in Las Vegas is holding off on upgrading to 11i until spring because of software quality concerns, according to Patricia Dues, a project manager in the city manager's office and an OAUG board member.

By then, the applications will be 2 years old "and just starting to settle down," Dues said. She added that Oracle, which has stopped taking part in the OAUG's events, might dispel some fears about 11i upgrades if it sent representatives to next week's conference.

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Users Look for Protection Against Technology Vendor Flameouts

Contract provisions aim to keep systems running

BY LEE COPELAND
NEW YORK

With so many technology vendors struggling financially as corporate users hold the line on spending, some savvy IT managers are adding new clauses into licensing and outsourcing contracts to ensure smooth operations should a key supplier go belly-up.

Roland Salvato, manager of contract and veodor relationships at Blue Shield of California, said three technology vendors used by the San Francisco-based medical insurer have bitten the dust during the past 12 months. That has prompted some new thinking on IT cootracts, Salvato said at a technology procurement conference held here by International Computer Negotiations Inc. (ICN).

"We're asking for protections, like lifting restrictions on hiring [a vendor's] staff and putting the software code into an escrow account," he said. "We didn't have those provisions in our cootracts before because these companies looked like they were stable."

And it's not just start-up vendors that are feeling the effects of hard economic times. IT executives who attended this mooth's procurement conference said they're also questioning the viability of some of their large vendors.

For example, Nationwide Mutual Insurance Co. regularly monitors the financial performance of its largest technology suppliers, said Patrick Campbell, IT procurement officer at Nationwide Services Co., the Columbus, Ohio-based insurance and financial services firm's IT arm.

Nationwide recently conducted a risk analysis on one of its telecommunications providers to address internal concerns about the struggling vendor, Campbell said. It also maintains relationships with alternate suppliers in case a vendor it uses goes out of business. "We try to mitigate risk by having options with our supplier base," Campbell explained.

The economic downturn is also causing many companies to take a closer look at their outsourcing arrangements, said Sharoo Horton, a consultant at Winter Park, Fla.-based ICN. Horton recommended that users put stipulations into contracts that would let them buy back IT equipment from outsourcers if necessary.

But conference attendees warned that even careful monitoring of vendors doesn't always ensure that IT managers will be able to detect when one of them is about to go under.

"Ongoing contract administration is probably the weakest part of contracting," said Jeff Hessenius, business manager at the state of Arizona's Government Information Technology Agency in Phoenix. "You can look at financial statements all day long and not see these things coming."

Arizona requires multivendor support on large IT contracts. For example, the state divided its PC fulfillment and support responsibilities among two PC makers and four computer services providers. One of the latter firms recently went out of business, but Hessenius said there was no disruption in service. "The other three companies were glad to make up the difference," he said.

Art of the Deal

Strategies for keeping tabs on struggling technology vendors, service providers and outsourcing firms:

- **CONDUCT** due diligence prior to signing any contract. That includes reviewing financial performance, litigation records and customer references.
- **REQUIRE** a transition period that provides time for ongoing support, personnel hiring and equipment buyback in the event of a vendor shutdown.
- **INCLUDE** a source-code escrow provision that ensures that a neutral third party has access to software source code and updates.
- **SEEK** early notice of shutdowns, and ask for monthly or quarterly reports about financial conditions, as needed.
- **STIPULATE** that software or services must be perpetuated for a predefined period in the event of a merger or acquisition.
- **ASK** for a lifting of restrictions on hiring a vendor's key project management and development personnel if a shutdown is imminent.
- **CREATE** a backup plan that includes alternate suppliers for the continuation of services or products.

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BRIEFS

Oracle Lowers Q2 Profit Forecast Again

Oracle Corp. CEO Larry Ellison warned that revenue and profits in the company's second quarter, which ends this month, will likely be lower than expected because of delays in software purchases by users. Oracle had already cut its second-quarter forecast after the Sept. 11 terrorist attacks. Now, Ellison said, net income should be similar to its $510 million first-quarter profit.

Novell Moves to Cut Workforce by 19% . . .

Novell Inc. announced plans to lay off 1,400 employees, a move that will trim its 7,400-person workforce by 19%. The cutbacks follow the company's July acquisition of Cambridge, Mass.-based Cambridge Technology Partners Inc. But Novell said it's also reacting to the IT spending decline and a lack of consulting business.

. . . While Ex-CEO Quits as Chairman

Novell also disclosed that former CEO Eric Schmidt resigned as chairman and gave up his seat on its board. Jack Messman, who took over as Novell's CEO after the Cambridge Technology purchase, is now also chairman. Novell had said that Schmidt would stay on as chairman and chief strategist after the acquisition, but he is now CEO of Google Inc. in Mountain View, Calif.

Short Takes

COVAD COMMUNICATIONS GROUP INC., a Santa Clara, Calif.-based Digital Subscriber Line services provider that filed for bankruptcy protection in August, said it signed a new $150 million loan agreement with San Antonio-based minority owner SBC COMMUNICATIONS INC . . . San Francisco-based e-mail outsourcer CRITICAL PATH INC said it received a $30 million cash infusion.

EMC, Compaq Move To Integrate Devices

Users' calls for storage interoperability prompt rival vendors to exchange APIs

BY LUCAS MEARIAN

Compaq Computer Corp. and EMC Corp., two of the fiercest competitors in the storage market, are opening their programming interfaces to each other to make it easier for IT managers to integrate their rival disk arrays on storage networks.

Bowing to user demand for open storage environments, Compaq and EMC this month agreed to cross-license their respective storage application programming interfaces (API). They said that should aid the development of storage management applications capable of handling storage devices made by both vendors.

Sarah Garrison, vice president of technology at Foster City, Calif.-based Visa U.S.A. Inc., said the Compaq-EMC deal gives the credit card company more options for future storage purchases and could help it consolidate the IT management tools it now uses.

"We can look at . . . reducing storage costs and centralizing management of it over time," she said. Visa's data processing supercenters currently store about 85% of the company's information on EMC equipment, Garrison said. But Compaq servers are used at several smaller sites to route messages from Visa's member banks.

Tony Prigmore, an analyst at Enterprise Storage Group Inc. in Milford, Mass., said the rival arrays made by Compaq and EMC are probably the most co-resident storage devices on corporate networks. Now, he noted, users will be able to have one management framework for both product lines.

The deal with Compaq came just a week after Hopkinton, Mass.-based EMC announced a new suite of storage management tools that can control its own arrays and rival products. The tool rollout "was the signal that we're not only opening our environment to cooperative software companies but to companies that historically have been our competitors," said Ken Steinhardt, EMC's director of technology analysis.

Don Langeberge, director of marketing for Compaq's storage software unit, said Compaq plans to release tools early next year that can centrally manage EMC's high-end Symmetrix disk arrays.

This isn't the first time storage rivals have pledged to work on improving interoperability. IBM and Santa Clara, Calif.-based Hitachi Data Systems Corp. agreed to share their storage APIs last June, just one day after joining Compaq, EMC and two other vendors in announcing plans to exchange technical data and cooperate on customer support.

Steinhardt said EMC is open to an API-sharing deal with IBM. But a spokesman for IBM's storage group said it has no plans to exchange APIs with either EMC or Compaq.

JUST THE FACTS

Storage Détente

- The API agreement will initially apply to Compaq's StorageWorks HSG80 array and EMC's Symmetrix devices.
- The companies are discussing expanding the agreement to incorporate EMC's Clariion mid-range storage line and the new Compaq StorageWorks HSV110 array.
- EMC and Compaq's storage management products will support both companies' devices by the next quarter.

Divine Looks to Buy Into Software, Services Markets

BY JAIKUMAR VIJAYAN

The sagging economy may have many managed service providers scrambling for exit strategies, but Divine Inc. feels that the current business climate has created a heaven-sent opportunity to piece together a suite of IT products and services.

The Chicago-based holding company, which was founded two years ago as an incubator firm for Internet ventures, is now busy snapping up troubled software vendors and providers of integration and managed application services at bargain-basement prices.

Divine has acquired or agreed to buy 29 companies since last fall. In the process, its combined revenue base has grown to more than $700 million. Divine's most recent deal is its $33 million acquisition of Dallas-based Data Return Corp. earlier this month.

Andrew "Flip" Filipowski, Divine's founder and CEO, is hoping to replicate the growth-through-acquisition strategy he pursued at Platinum Technology Inc. before selling that company to Computer Associates International Inc. for $3.5 billion in 1999.

But pulling that off again won't be easy, analysts cautioned. For starters, Divine must "prove that it can integrate all these properties, keep the [workers] and push the whole thing into the market in a way that appears cohesive and stable," said Joel Yaffee, an analyst at Giga Information Group Inc. in Cambridge, Mass.

The wide spectrum of Divine's acquisitions also makes it hard to pin down exactly what the company's core capabilities are, said Andrew Schroepfer, an analyst at Tier 1 Research Inc. in Minneapolis.

"Divine's trying to get into a whole lot of spaces, without showing any evidence that they can be successful in the long term," Schroepfer said.

Last week, Divine reported a third-quarter net loss of $85.8 million on total revenue of $48.1 million. But Filipowski said he expects the acquisition strategy to create a software and services powerhouse focused on building extended enterprises that tie companies' internal systems to those of their partners and customers.

Shopping Spree

Divine has completed or announced eight acquisitions within the past two months, including the following stock-swap deals:

- **Data Return Corp.**, a Dallas-based firm that hosts Windows-based applications. **Value: $33M**
- **RoweCom Inc.**, a Westwood, Mass.-based provider of content procurement tools. **Value: $19M**
- **Eprise Corp.**, a Framingham, Mass.-based developer of content management tools. **Value: $43.2M**
- **Eshare Communications Inc.**, a Norcross, Ga.-based maker of customer interaction software. **Value: $71.1M**
- **Open Market Inc.**, a Burlington, Mass.-based developer of e-business software. **Value: $23M**

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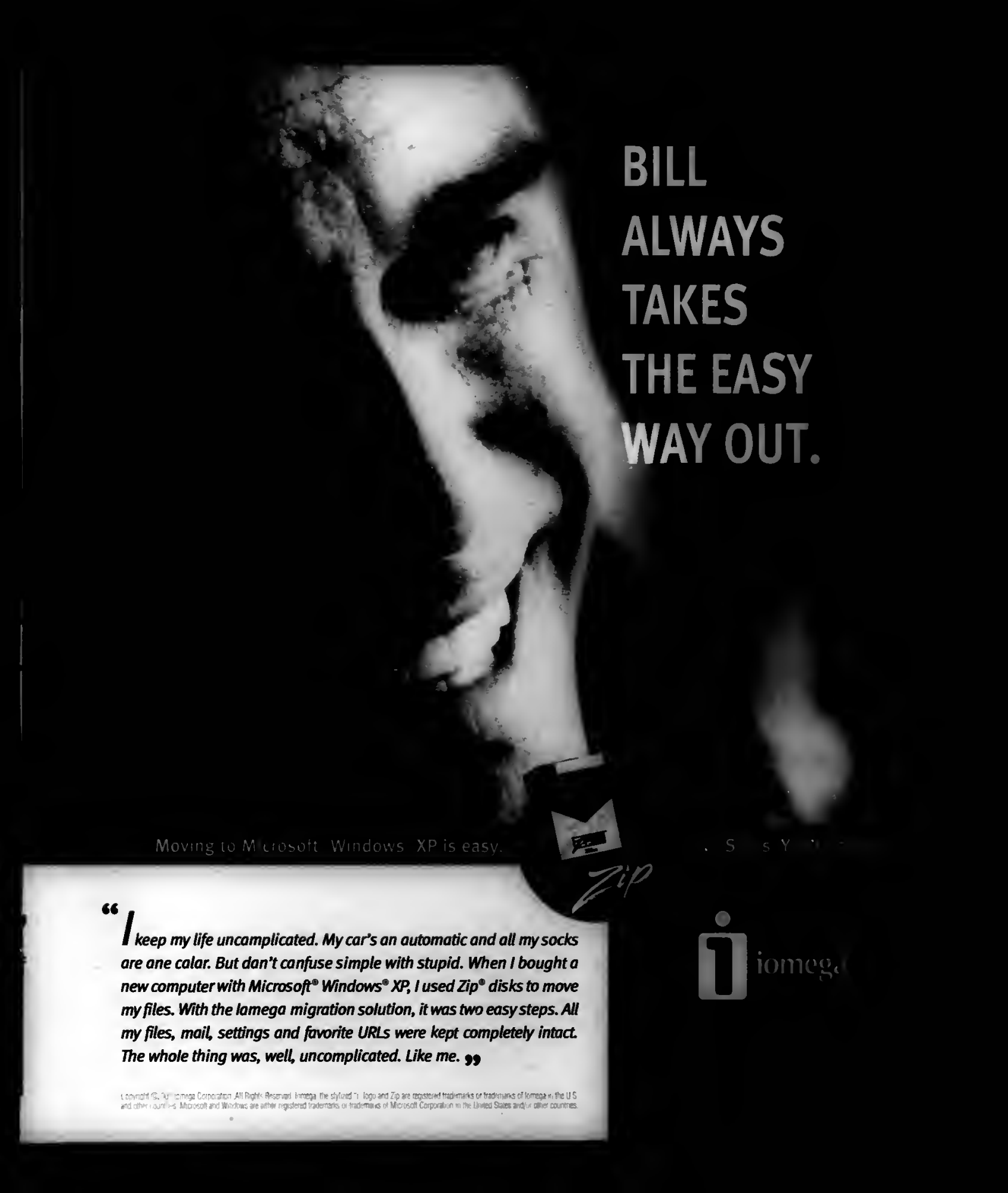

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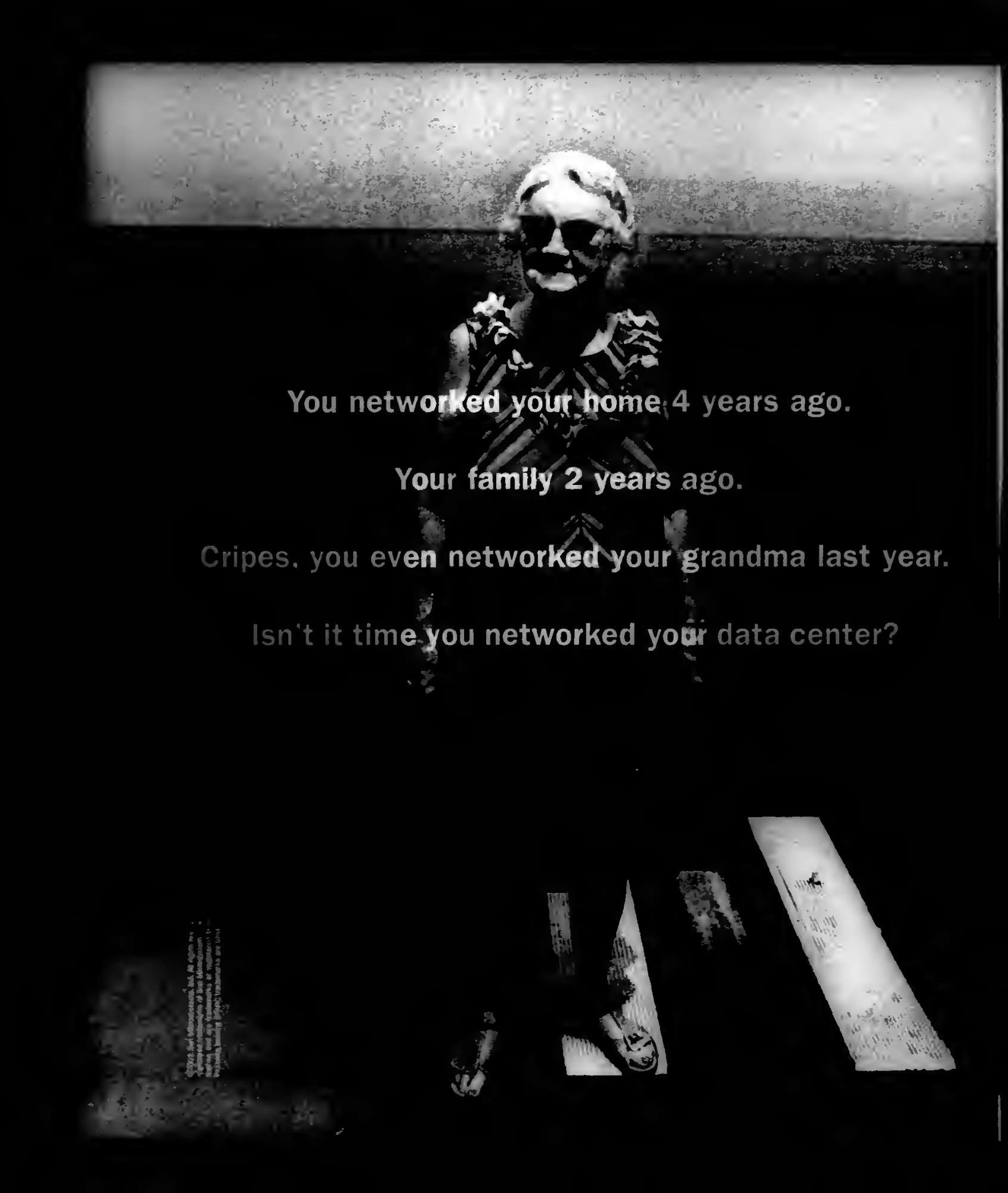
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MARYFRAN JOHNSON

Stomp Out UCITA

THREE CHEERS FOR McDONALD'S and its senior counsel, Dave Weidenfeld, for spitting in the eye of the abomination known as UCITA. When this vendor-backed software licensing law reared its ugly head in a recent contract negotiation, the fast-food giant flat-out refused to do business with the vendor involved [Page One, Nov. 12]. "We would not do the deal . . . and eventually they caved in," Weidenfeld told our reporter.

MARYFRAN JOHNSON is editor in chief of *Computerworld*. You can contact her at maryfran_johnson@computerworld.com.

UCITA, or the Uniform Computer Information Transactions Act, is a so-called model contract law developed by the National Conference of Commissioners on Uniform State Laws (NCCUSL). Once adopted by a state — as so far only Maryland and Virginia have cravenly done — it provides a uniform contract law covering computer software, databases and online information. What it really does is hand vendors an appalling amount of unfair power over users.

Among the more heinous attributes of this lousy law is a provision — smugly called "electronic self-help" — that even the vendors are now cringing about and offering to remove. This little gem lets them build secret "back doors" into software code so they can remotely shut down a user's system during a contract dispute, not only wreaking business havoc but compromising IT security, as well.

UCITA faces wide-ranging, unanimous opposition from large companies such as The Boeing Co., Nationwide Mutual Insurance Co. and Caterpillar Inc., along with several state attorneys general, the American Library Association and IT user groups. Yet the commissioners from NCCUSL have paid contemptuously little heed to their concerns. Unlike many other uniform laws prepared by the commission, UCITA was never even sent to the American Bar Association for its review. Wouldn't want an honest legal review getting in the way of a good power play.

The only encouraging news lately is that eight states have spurned UCITA, forcing reconsideration of the "self-help" provision. But that's applying a Band-Aid where major surgery is required.

UCITA should be stomped to death before any other states foolishly adopt it. In the meantime, scrutinize your software contracts more carefully than ever. If your vendor "partner" starts weaving in any UCITA provisions, grab your company lawyers and fight back like McDonald's did.

GETTING MONEY BUDGETED FOR SECURITY IS EASIER THIS YEAR THAN I CAN EVER REMEMBER.
DID YOU SAY SECURITY? HERE-TAKE THIS!!
HOW MUCH DO YOU NEED?!
DID SOMEONE SAY SECURITY?

PIMM FOX

Talking Turkey On Web Services

THIS THANKSGIVING, consider the legacy dishes that will grace your table. There's turkey according to a family recipe, traditional stuffing from an old cookbook and cranberry relish that arrives with the distant cousin you see once a year. These are the basics, the core of the Thanksgiving experience.

PIMM FOX is *Computerworld*'s West Coast bureau chief. Contact him at pimm_fox@computerworld.com.

But then comes the plenitude of side dishes that don't resemble food so much as wild experiments in inventiveness that no one has the nerve to refuse.

Thanksgiving is, by nature, a kind of interoperable feast, requiring little or no alteration to your proprietary kitchen format; yet someone always tries to upgrade the simple meal into a gastronomic mystery.

This is happening in the planning stage of the multicourse feast dubbed Web services.

I'm not a bumbug about the theory of Web services; the idea to integrate distributed applications makes sense. Despite the flawed efforts at interoperability, such as DCOM implementations for Unix and OS/390, or CORBA/IIOP for Windows, there are some reasons to give Web services a serious look. For example, XML and SOAP are great tools for building basic distributed systems.

But the reality of giving interoperability a new try is fraught with dangers for two reasons: People haven't been prepared for it, and there's no business reason to spend the money.

Separated along Unix, Windows and OS/390 lines, developers still compete for projects, resources and people. "The Unix people [C, Perl, PHP, Java] view Windows developers [Visual Basic, Active Server Pages, COM] as technically immature and not ready for enterprise software development," observes Tim Chester, senior systems analyst and project manager at Texas A&M University. "Mainframe geeks [Cobol, Natural, assembler] have concerns about the reliability, security, and scalability of Unix and Windows platforms, and Windows people view mainframe and Unix groups as overpriced and too complex."

Mature Web services may offer a compelling, cost-effective way to expose stored procedures to

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other services. But to get there, companies will have to rely on third-party integrators and tools to turn applications into HTTP services.

Deryck Jones, formerly group vice president and CTO at OneMonday Group, an international public relations and online marketing firm in London, said executives look at Microsoft Access and Front Page and see sophisticated tool kits. "They don't realize the cost, manpower and years of follow-on support these solutions — that look good in the short term — require," said Jones.

Unless you can prove that a Web service will increase revenue or decrease the cost of doing business, don't get fancy with new dishes. Stick to turkey; it's the only leftover people really want.

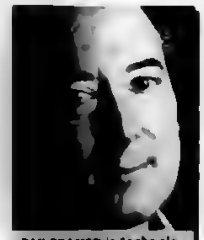
DAN GILLMOR

IT's Role in a Changed World

NO ONE WITH A CONSCIENCE wants to profit from terrorism. But new developments in the technology market will be at the core of our response for years to come.

Some of the uses will be benign by any standards — such as videoconferencing, distance learning and training, decentralization of data and computing services, and protective bioengineering. Some will be less so — surveillance, national ID cards and other measures that could turn a free society into a police state, all in the name of protecting ourselves.

One of the technologies that's certain to grow in value is the core function of the Internet. I'm referring to e-mail, of course. When murderers lace postal mail with killer germs, the incentive to do more business electronically rises in proportion to the threat. Yet e-mail isn't risk-free; it carries bugs that don't kill people but can kill or harm vital systems. Now that IT is beginning to insist that software vendors take security seriously, communications safety is improving.



DAN GILLMOR is technology columnist at the *San Jose Mercury News*. Contact him at dgillmor@sjmercury.com.

Cybersecurity firms are bound to be big winners, in any event. Even if people outside the U.S. don't try to disrupt internal systems, domestic bad guys and government snoops will make it essential to take stronger measures to keep information safe.

The value in decentralizing, for safety and other reasons, is clear enough to everyone now. But to make it work, companies will have to invest in products and services that go beyond data centers and disaster recovery. Conferencing and distance training via video and the Web are now seen as sensible by almost everyone, for example. If bandwidth continues to grow, spending on those technologies will be an utter no-brainer.

And over time, technology will help us conserve energy, not just replace nonrenewable sources such as oil from unstable parts of the world. Our electricity and natural-gas grids are vulnerable, and nuclear plants surely rank near the top of terrorists' hit lists. We must do more "microgeneration" of electric power — using renewable sources, fuel cells and other technologies — or risk unthinkable consequences.

Technology will also be key to protecting us from bioterrorism. We'll need rapid detection systems — devices that sniff the environment and tell us quickly if there's a threat. Then we'll need fast development of new drugs and antidotes. For all this, biotechnology and bioengineering, increasingly the marriage of biology and IT, look like crucial links in our national self-defense.

In a way, so too does an old-fashioned notion that's being updated all the time — the suggestion box. The Pentagon, as top-down an organization as we have in our society, has asked the public to send ideas on how to combat terrorists. The request can be found at *www.defenselink.mil*.

The national security community, which includes public health agencies in this new era, needs to expand on that principle. Technology, again, gives us the means. Tapping our collective knowledge — and there are great ideas outside Washington — will bring big rewards.

Tapping everyone's phone, e-mail and other communications may not bring the value claimed by law enforcement. But surveillance technology is a growth industry. The winners, if we create pervasive surveillance, will be the companies that sell things like face-scanning gear and data-crunching software that look for specific words or patterns in e-mail or other communications. IT people should understand that they will be draftees in this war on privacy.

READERS' LETTERS

Just Say No to IDs

NATIONAL ID cards ["It's Time for a National ID Card," *Computerworld.com*, Nov. 2]? It's tempting to replace a patchwork of kludgy state-based authentications and in so doing help find and foil bad guys. But our government will farble it up. The tracking mechanisms that would have to be created would cast a wide net across the citizenry. You might trust George W. Bush with your travel and payment data, but would you have trusted Richard Nixon with it? Assume too that government, in the name of consumer protection, will require private businesses to use the card for completion of transactions and that the Census Bureau, the Commerce Department, the FBI, the IRS and other agencies will be drooling after this data. Benefits would be realized only if the government were serious about back-office integration of tens of thousands of old and sometimes proprietary federal technologies. Without a federal CIO and a tangible, proactive national technology strategy, that won't happen soon.

Cathy Hotka
Vice president, IT
National Retail Federation
Washington

IF WE GIVE UP the freedoms we enjoy by giving in to such ideas, then we have lost the battle to protect our way of life. Instead of creating new and complicated systems that come at heavy cost and only mean more bureaucracy, we could take what we have and make it work more efficiently.

David Elias
Integrator
Allentown, Pa.

I WILL NOT allow terrorists to cause well-meaning but misguided people to reduce my freedom. The technology is irrelevant to this issue.

Jay Callaham
Owner/consultant
Callaham Telecommunications Management
Greensboro, N.C.

A Bit of History

EVEN BEFORE 1945, punch card machines were already computing at a faster rate than people were. ["Computer Consciousness," Technology, Nov. 5]. One example is a project of the U.S. Naval Observatory that computed the orbits of the outer planets, published in several volumes so that astronomers who were still doing hand computations could have accurate data to use for computing the orbits of other bodies in the solar system.

H. Jay Carr
Alticor
Ada, Mich.

Knowing CIO's Worth

AS A CERTIFIED old guy, let me offer an opinion on the early reporting relationship between financial services and what was then data processing ["Best Boss for the CIO," Business, Oct. 29]. The accounting types owned all the operational information in most companies before IT came on the scene. They were the kings of answers to all sorts of questions. With the advent of IT, there was a second, and much richer, source of operational information. Accountants, being socially limited but basically bright, did their damnedest to keep the information developed by IT within their control. Enlightened CEOs generally made the information officer a direct report.

Al Weigand
Jacksonville, Fla.

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Sleepy No More

This is your wake-up call. Linux is rising, .Net Server is on the horizon, and z/OS is shaking up software pricing.

EDITOR'S NOTE

Space Alien Picks Linux

WHO WOULD'VE thought that server operating systems could be so interesting? OK, so they're not as interesting as some tabloid headlines I've seen recently — "Hillary Calls Off Divorce" and "Charles Dumps Camilla" — but for the IT world, this is pretty good.

Here we have an otherwise serious IT manager who's ecstatic over the prospect of "stupendous savings" in mainframe software prices. How could that be? Well, it turns out the metering technology with IBM's new z/OS will allow dramatic reductions in software costs (page 40).

SERVER OS

Then, there's the emergence of open-source Linux, which some analysts say will join the pantheon of enterprise operating systems before the end of the decade.

On the other hand, some have suggested that Linux will merely fill certain niches, and, in the meantime, Linux vendors are struggling financially. IDC points out that Microsoft's operating system business makes more money in a week than Linux does in a year. I love the title of a recent Gartner bulletin: "Sooner or Later Even Linux Has to Turn a Profit."

And finally, there's .Net Server — which you've never heard of, judging from the experience of our reporter Carol Sliwa. (Hint: It was code-named Whistler. See page 28.) Sliwa visited a Microsoft conference booth where the presenter asked for a show of hands to see if anyone knew what .Net Server is. Out of three dozen attendees, no one did (except Carol, of course). Here in *Computerworld*, you'll get a sneak preview of this successor to Windows 2000.

I hope you'll check out this special report, because selecting the right enterprise operating system is one of the most momentous decisions you can make. And it probably means more to your career than Hillary or Camilla. ◗

Mitch Betts is director of Computerworld's *Knowledge Centers. Contact him at mitch_betts@computerworld.com.*

LUISA LISTOVA

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ONLINE EXCLUSIVES

■ You'll find additional stories and resources in the Knowledge Center on Server Operating Systems: www.computerworld.com/q?id1500

Should You Make the Lea

Windows .Net Server, a forthcoming upgrade to the Windows server operating system family, may not make sense for some companies. By Carol Sliwa

ASK IT MANAGERS about their upgrade plans for Windows .Net Server, and their initial reaction may be puzzlement. Many users — and even some industry analysts — are unaware that Microsoft Corp. chose that name for the successor to its Windows 2000 Server operating system. Windows .Net Server had long been code-named Whistler (and briefly dubbed Windows 2002 Server) before getting its present moniker in June.

But now that Windows .Net Server will miss its original year-end ship date, users will have some extra time to learn about the new server operating system. Microsoft officials say the product won't ship until the first half of next year, and some analysts predict that it won't arrive until June.

For many corporate users, the delay will hardly be noticed. Companies generally have been slow to migrate to Windows 2000 Server — particularly if they've had to plot a move to Microsoft's new Active Directory. And plenty of corporations are still running applications on Windows NT 4.x Server, with no immediate plans to change.

Companies with NT 4.x Server shouldn't wait for Windows .Net Server, advises Cliff Reeves, Microsoft's vice president of marketing for Windows .Net Server. They "should absolutely think about Windows 2000," he emphasizes, insisting that Windows NT is simply "the camel's nose in the tent of the enterprise," while Windows 2000 is "a very strong, more-than-credible product in that space."

By most accounts, the Windows 2000 family — which includes Server, Advanced Server and Datacenter Server versions — has lived up to its billing as more stable, reliable and scalable than Windows NT 4.x Server. "The performance itself is dramatically better," says Tom Manter, an analyst at Aberdeen Group Inc. in Boston. "The real question from the business perspective is, Can they afford to wait for .Net Server?"

Windows .Net Server — which will have Standard Server, Enterprise Server, Datacenter Server and new single-purpose Web Server versions — doesn't represent the major leap forward that Windows 2000 Server did, analysts say. Tom Bittman, an analyst at Gartner Inc. in Stamford, Conn., says Microsoft's Whistler investment has focused on consumer clients. "This wasn't set up as a release for enterprises," Bittman says. "We see this as a major service pack or as a point release."

ap?

There are some potentially useful — albeit incremental — improvements in Windows .Net Server. However, industry analysts advise users to evaluate the operating system on a feature-by-feature basis to see if their companies would benefit from them.

Active Directory, for instance, will be enhanced to support LDAP-based single-connection authentication of multiple users and the widely used inetOrgPerson class of objects for identifying users. IT managers will also see replication between domain controllers improved and gain the ability to load directory content from tapes, CDs or DVDs and establish root-level trust among forests of users.

But in order to benefit from the new features, all Windows 2000 domain controllers must be opgraded to Windows .Net domain controllers, since the newer operating system will detect any old domain controllers and disable all features that are incompatible.

Gartner analyst John Enck predicts that most of his clients won't see enough value in the new Active Directory features to justify the upgrade. "For most companies that have put a lot of energy into deploying Windows 2000 servers, it makes the most sense to skip .Net Server and wait for the next release," he says.

Windows .Net Server's biggest target audience will be application developers, according to Reeves. Developers should find it easier to write Web applications and Web services because of the new operating system's built-in support for the .Net framework.

The .Net framework incorporates a unified set of class libraries and the Common Language Runtime (CLR), letting applications written in more than 20 supported languages run on Windows .Net Server. Another key piece is ASP.Net, whicb is the code that handles the dynamic calls that connect a Web page to a Web application.

"If you want to take advantage of low-cost, Intel-based hardware to build what can be sophisticated applications, you've now got a much easier, straightforward, cost-effective way to go about doing it," says analyst Will Zachmann at Meta Group Inc. in Stamford, Conn.

But unless a corporation is using Windows .Net Server for Web applicatioo development and wants the new Internet Information Server 6.0, it may not see a compelling case for change. Even if a company is focused on that area, it may not need to make an instant switch.

Kollen Glynn, vice president of product development at EarthConnect Corp. in Seattle, notes that his company was one of the first to do commercial Web services work for the financial industry. He says he'd like to use Windows .Net Server, but in the meantime, it's not difficult to load the CLR onto his company's Windows 2000 servers.

"If that were the only reasoo you were switching to .Net Server, that wouldn't be a reason," Glynn says, noting that Microsoft has made it easy to install the .Net framework.

Glynn is more curious to explore the 64-bit capability Microsoft promises in its next Datacenter offering, since he could use more addressable memory for back-end databases.

Datacenter is Microsoft's challenger to high-end Unix systems, but that market has been tough to crack. "The demand for those is just really starting to evolve, with the Itanium processors from Intel starting to get out there," says Dwight Davis, an analyst at Boston-based Summit Strategies Inc.

Bittman advises users not to leap to the 64-bit servers right away. "Let the application developers work with it for a while, and wait for the second generation of hardware," be says.

Some companies may see benefits in the enhanced management features of Windows .Net Server. Bellevue, Wash.-based digiMine Inc., which has beeo beta-testing the new operating system, hosts data warehouses for more than 40 customers on Windows 2000 Advanced Server and SQL Server 2000. When upgrading the service, digiMine now must send customers an installation file, new code and instructions. But Windows .Net Server can be set up to make sure a customer is using the most current version of the application — and provide the update if it's not.

"The management of the application can now be controlled remotely," says Bassel Ojjeh, digiMine's chief operating officer.

Improved performance and ease of use will drive Stephen Vickory, a project manager at Pomeroy Computer Resources Inc. in Greensboro, N.C., to switch to Windows .Net Server.

"You're not going to have to be a rocket scientist to use it anymore," Vickory says, citing the improved wizards and help features in the beta version he's testing.

Whether features such as that will drive massive upgrades remains to be seen. Analysts say companies that may have been forced to delay IT projects due to economic conditions might want to consider deploying Windows .Net Server if they haven't started their Windows 2000 Server deployments by tbe middle of next year.

But users who just installed Windows 2000 or have plans to do so io the next six months probably won't be champing at the bit to get their hands on Windows .Net Server.

"The norm is, 'Don't go.' It's not worth the ROI," says Bittman. "Skip this release and wait for the next one." ◗

What's New in Windows .Net Server?

General Features
- Support for 64-bit Itanium processor
- Clustering enhancements, including four-node clustering in Enterprise Server
- Remote management improvements

Collaboration Features
- Built-in real-time communications server for voice, video and application sharing
- Support for SharePoint Team Services

Development Features
- .Net framework integration with built-in support for XML and Simple Object Access Protocol
- Common Object Model+/XML Web service integration
- Native support for the Universal Description, Discovery and Integration protocol
- Microsoft Message Queue native XML support
- Internet Information Server 6.0 fault-resilient process architecture

Directory Features
- Support for LDAP-based single-connection authentication of multiple users
- Support for the widely used inetOrgPerson class of objects for identifying users
- Ability to load directory content from tapes, CDs or DVDs
- Cross-forest trust

Quick Link

ONLINE EXCLUSIVE
- A Microsoft executive reveals the strategic direction of the vendor's server operating system, including code names and characteristics of future releases.

www.computerworld.com/q?24700

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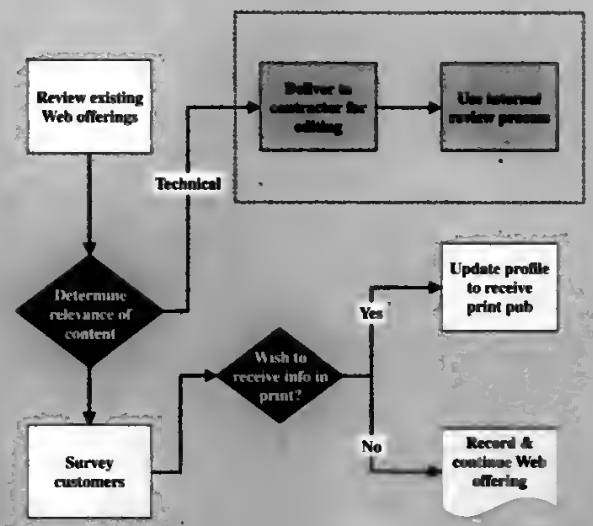

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Windows 2000 Server

TIMELINE

FEBRUARY 2000: Windows 2000 Server released

AUGUST 2000: Service Pack 1 released

MAY 2001: Service Pack 2 released

IDEAL USE: Departmental printer- and file-sharing, small Web sites, e-mail; supports up to 4GB and four processors

PRICE: $999 for five users; $1,199 for 10 users

HOW IT'S DOING: By far the most popular of the three Windows server operating systems, Windows 2000 Server accounts for 70% to 90% of all Windows server sales, analysts say. Its low price is often a make-or-break factor, says Al Gillen, an analyst at IDC in Framingham, Mass. "If you need a low-end server, you're usually looking for lowest cost," he says.

Case Study

WILLIAM BLAIR & CO., a $355 million private investment banker in Chicago, has started a project to convert most of its 40 to 50 Windows NT servers to Windows 2000 Server, says Jim Connors, chief technology officer. By the end of next year, portfolio management — which is a series of client tracking and trading applications — and various Microsoft SQL Server database systems will all run on the standard Windows 2000 Server and be accessed by the company's 1,000 users. "Our servers aren't huge, with unbelievable levels of sophistication, so the standard [server] product serves our needs," Connors says. "And the price makes sense."

William Blair will run a handful of Advanced Servers, but only for its applications that need clustering, such as e-mail. "We're forced to use it. That's just not available on the standard version," Connors says. Two or three internal IT people are working on the server conversion project, but not full time. "We're converting from a fairly stable environment and don't have to rush and push and slam something in," he explains.

JIM CONNORS

Which OS is right for you? Depending on your budget and the size of your operation, one of Microsoft's three Windows 2000 servers could fit the bill. By Kim S. Nash

Servers for Every S

Windows 2000 Advanced Server

TIMELINE

FEBRUARY 2000: Windows 2000 Advanced Server released

AUGUST 2000: Service Pack 1 released

MAY 2001: Service Pack 2 released

AUGUST 2001: Microsoft announces that 64-bit Limited Edition version will ship next year

IDEAL USE: Busy Web sites; large applications, such as e-commerce or enterprise resource planning; supports up to 8GB and eight processors
PRICE: $3,999 for 25 users
HOW IT'S DOING: With its larger memory and multiprocessor capabilities, Advanced Server helps the Windows 2000 lines of servers compete directly with meatier Unix operating systems. Advanced Server supports clustering, while the standard edition does not.

Case Study

AIR PRODUCTS AND CHEMICALS INC. is no stranger to Windows 2000 Advanced Server.

The $5.5 billion industrial gas and chemicals company already runs Advanced Server in line-of-business applications that use Microsoft's SQL Server database, such as order entry and maintenance planning, and in its e-business Web site.

Now, the Allentown, Pa.-based company is in the midst of rolling out at least 50 more copies of Advanced Server in conjunction with a major implementation of human resources applications from SAP AG.

By February, Air Products plans to be running customer relationship management, supply chain and other SAP applications on Advanced Server in its European offices.

Datacenter Server would have been too complex for the environments in question. "It's overkill," says Roger Gariepy, chief IT technologist at Air Products.

The company decided three years ago to "more highly leverage" Microsoft servers to cut complexity for its IT department. In all, the company has about 800 Microsoft servers, Gariepy says. The decision to use Windows 2000 Server and Advanced Server wasn't based on a feature-function comparison with Unix, he says. Rather, Air Products liked the strong integration of Microsoft applications with Microsoft operating systems. The idea, he says, is "sameness and simplicity."

ROGER GARIEPY

Windows 2000 Datacenter Server

TIMELINE

SEPTEMBER 2000: Windows 2000 Datacenter Server ships

SEPTEMBER 2001: 300 to 400 companies are running Datacenter in production, about 1,000 licenses have been sold, according to Tom Bittman, an analyst at Gartner Inc. in Stamford, Conn.

FIRST HALF OF 2002: Limited Edition expected to ship

IDEAL USE: Enterprise-level and high-availability applications (data warehousing and heavy duty e-commerce); supports up to 64GB and 32 processors
PRICE: A closely guarded secret among the 12 hardware makers that sell it
HOW IT'S DOING: Compaq Computer Corp. and Unisys Corp. are the top Datacenter vendors. IBM puts its own spin on Datacenter marketing, calling it "mainframe-inspired." Unlike Microsoft's other two server operating systems, Datacenter comes with access to a single technical support line, plus systems integration services from the hardware vendor. "Datacenter is where you go when you need the highest level of availability," says Bittman, "but you get it through services and not the server [operating system] alone." The relatively few Datacenter customers — IDC estimates they account for a fraction of 1% of total Windows server sales — are usually already committed to Windows products; that is, Unix shops aren't converting.

An upcoming Limited Edition version is due to support Intel Corp.'s latest 64-bit chip. It will be part of Microsoft's .Net family.

Case Study

Monroe, Mich.-based **LA-Z-BOY INC.** is almost through consolidating 12 Compaq servers running different Microsoft operating systems onto one big Unisys box running Windows 2000 Datacenter Server.

The Unisys ES7000 machine now hosts systems management tools from Hewlett-Packard Co. and IBM's Tivoli Systems Inc. unit, all file and print services for the corporate office, e-mail and several other applications.

One reason La-Z-Boy chose Datacenter over Windows 2000 Advanced Server is because it gives the company, which had $2.3 billion in sales last year, room to grow, says Gary Clark, director of corporate IT services. Much IT work is still dispersed in the company's business units, including shop-floor applications. But future acquisitions and expansion mean centralized IT services will continue to grow.

GARY CLARK

La-Z-Boy rejected more-proven Unix and mainframe systems in part because IT professionals who know Microsoft products are more readily available for hire, says Clark. "We have a mainframe. We have Sun and all those other products. But having looked for Unix and mainframe resources, I know that's not as easy a task as finding people to support the Windows architecture," he says.

With Datacenter, it's easier to add memory or processors than with other operating systems, Clark says. Datacenter is also easier to partition, or allocate sections of the operating system to specific tasks, he says. "Let's say I typically get a spike on Internet traffic at 10 a.m. and 2 p.m. If I need to allocate two additional gigabytes of memory or more processors, I can do that based on load," he says. "These are not necessarily things you can do with an OS other than Datacenter."

Slow Road to Active Directory

Pioneer users who have been through a Windows 2000 Active Directory deployment say there's no substitute for patience — and experience.

By Robert L. Mitchell

WINDOWS 2000'S Active Directory (AD) may offer big improvements over Windows NT 4's flat domain model. But early adopters say that although the results have been good, the transition has been slow and sometimes painful. Along the way, these IT professionals have gained experience that could benefit other organizations planning to migrate to AD.

Many early deployments have gone more slowly than anticipated, users and consultants say. Large deployments can take several years, so IT managers should set their expectations accordingly.

For example, General Motors Corp. launched its AD initiative in August 1999 but is still migrating its 115,000 users from Windows NT and Novell Inc.'s NetWare. "We're aggressively working to have [all users migrated] by the end of 2002," says Kent Pate, a migration and interoperability engineer at GM.

SERVER OS WINDOWS

Why will it take so long? "When you're looking to image [desktop PCs] over the network, bandwidth becomes a limitation," Pate says. Plans to upgrade workstatiuns to Windows 2000 have also led to long deployment times.

Wells Fargo & Co. began a workstation deployment in March last year, says Tom Egan, a vice president for the wholesale group at the San Francisco-based bank. He hopes to have 10,000 workstations migrated by February, he says. After that, other groups will still need to migrate about 100,000 machines.

"I wish we could have made the rollout without touching every workstation," he says. "We've gone as far as we can to automate the process, but we've still got at least a 40-minute upgrade at each machine."

Only a handful of other large-scale AD implementations with more than 50,000 objects have been undertaken, and few have been completed, says John Enck, an analyst at Stamford, Conn.-based Gartner Inc. While Enck says initial benchmarks look promising, he cautions that scalability has yet to be fully proved in the field.

Supporting Roles

Deployment may take up most of the time, but getting the initial design right is the most critical step — and the one where outside consultants can have the biggest impact, practitioners say. BancorpSouth Inc. in Tupelo, Miss., needed a design that would accommodate the $10 billion bank's 280 locations and more than 3,500 clients in six states. The IT team went to training on Windows 2000.

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"I would strongly recommend bring-

Continued on page 36

Slow Road to Active Directory

Pioneer users who have been through a Windows 2000 Active Directory deployment say there's no substitute for patience — and experience.

By Robert L. Mitchell

WINDOWS 2000'S Active Directory (AD) may offer big improvements over Windows NT 4's flat domain model. But early adopters say that although the results have been good, the transition has been slow and sometimes painful. Along the way, these IT professionals have gained experience that could benefit other organizations planning to migrate to AD.

Many early deployments have gone more slowly than anticipated, users and consultants say. Large deployments can take several years, so IT managers should set their expectations accordingly.

For example, General Motors Corp. launched its AD initiative in August 1999 but is still migrating its 115,000 users from Windows NT and Novell Inc.'s NetWare. "We're aggressively working to have [all users migrated] by the end of 2002," says Kent Pate, a migration and interoperability engineer at GM.

Why will it take so long? "When you're looking to image [desktop PCs] over the network, bandwidth becomes a limitation," Pate says. Plans to upgrade workstations to Windows 2000 have also led to long deployment times.

Wells Fargo & Co. began a workstation deployment in March last year, says Tom Egan, a vice president for the wholesale group at the San Francisco-based bank. He hopes to have 10,000 workstations migrated by February, he says. After that, other groups will still need to migrate about 100,000 machines.

"I wish we could have made the rollout without touching every workstation," he says. "We've gone as far as we can to automate the process, but we've still got at least a 40-minute upgrade at each machine."

Only a handful of other large-scale AD implementations with more than 50,000 objects have been undertaken, and few have been completed, says John Enck, an analyst at Stamford, Conn.-based Gartner Inc. While Enck says initial benchmarks look promising, he cautions that scalability has yet to be fully proved in the field.

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Continued on page 36

You've been trying to conjure up the magic combination of servers and operating systems that will finally bring together your company's various departments.

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Active Directory Potholes

You can learn some things about AD from the school of hard knocks, say consultants and users. Here are some AD weaknesses identified by deployment pioneers:

Service packs may cause unexpected problems. "Service Pack 2 has created some random errors here and there – people not able to log in, not getting proper drive mappings, that sort of thing," says Todd Wright, engineering manager at Wells Fargo. Service Pack 1 created some problems, too, "but we're not sure if it was the way AD was designed at Wells Fargo or if it's a shortcoming with AD," he says.

Password replication. In AD, password changes aren't immediately replicated. "That's caused us the most headaches," Wright says. A password change may not be updated for five to 15 minutes.

Security isn't granular enough. "I would prefer a more granular security model. I would like to be able to restrict administrators to manage only certain domain controllers. We don't have that ability today," says Ken Pate, a migration and interoperability engineer at GM. "We work around that by only allowing one organization to control the administration of those domain controllers."

Continued from page 34

ing in [outside consulting] experience on the overall organizational unit design," agrees Todd Wright, engineering manager at Wells Fargo. "But everything else — designing the desktop and even the physical domain controller and global catalog — could be done by someone [in-house] who knows the NT world."

Consultants can help, but the final design decisions are yours to make, cautions Enck. "The biggest issue I've seen is that Microsoft-trained consultants push clients really hard to a single domain model and push for AD to be the DNS [Domain Name System] server of choice in the enterprise," he says. Unfortunately, "there are too many business cases where you can't do a single domain," he adds.

Domain Decisions

BancorpSouth decided to implement a two-domain design: an empty root domain, and a child domain that contains the bank's directory information. Within that, Hann created organizational units (OU) based on the bank departments common to each branch. With this design, "if something happened [in the child domain], the other domain would have the information to be able to [recover]," he says.

It would also accommodate acquisitions. "If we acquire someone else that already has [an AD domain] design, we can bring them in with ease," he says. Microsoft Corp.'s planned support for cross-forest trusts will make it easier for users to deploy AD on the upcoming Windows .Net Server, scheduled for release in mid-2002.

In contrast, GM's global operations dictated a design based on geographic region. "It had a lot to do with how AD was going to be administered," says Bob Cole, GM's manager of global desktops. For example, some countries have regulations requiring that user account information be housed within that country.

Although Wells Fargo and GM already had Novell Directory Services domain hierarchies, both firms chose to create a new design rather than pursue an in-place upgrade. "We wanted to start clean," says Cole.

Wells Fargo created 10 regional domain controllers but organized its OUs along business lines. "It allows us to logically group together businesses and distribute software better," Wright says. But if you have slow links between sites, be cautious, the preferred method would be geographical.

OU design is critical for administration and performance. "If you let yourself get thrown into one flat OU structure without giving any thought to how policies might be applied, it's going to be very hard for you," Wright says.

Wells Fargo created a sophisticated OU hierarchy that includes global group policies that propagate down to the OUs of individual business units. From there, "if they want to lock something down further, they can create their own group policies and links that would apply after the [global] policy gets applied," Wright says.

But, he cautions, "until there is a good tool for determining which group policies are applied and where they're coming from, you have to be really organized about only defining them in once place."

Active Directory's OU structure allows the creation of group policies at a very granular level, says Wright. "As long as you don't apply too many group policies in each OU, you don't seem to suffer much of a performance problem," he says.

DNS Dependence

Even the best AD design can't work without a solid DNS. "DNS is now the core component of Windows 2000 . . . from a name-resolution standpoint and is what drives everything else," says Aric Bernard, a senior technical consultant at Compaq Global Services, part of Compaq Computer Corp.

Many companies already have an enterprise DNS in place, although the DNS and Windows server administrators may be in different IT groups. Both must be involved in the new design, according to users and analysts.

"You have to put a lot of thought into your legacy DNS and whether those are going to be autonomous or if you're going to migrate," says Pate.

The DNS administrators are likely to resist migrating to a Windows 2000 enterprise DNS, and they may have a good point. Although Microsoft encourages the use of Windows 2000 as the default namespace, doing so "is just not practical for a lot of companies," says Enck.

Fortunately, you don't have to set up a Windows 2000-based DNS to support your entire infrastructure. Third-party DNS packages and Berkeley Internet Name Domain 8.2.8 are fully interoperable with Windows 2000 DNS, Bernard says.

Users report that the AD migration effort, while time-consuming, has been worthwhile. They cite benefits in the areas of server consolidation, scalability to support more objects and easier administration.

So, what are the keys to success?

"It's the design upfront. That's the most important thing," says Wright. "I can't emphasize enough the need for naming standards, for organization of group policies and for OU design with regard to how policies are applied."

And make sure you have plenty of resources for the migration, which can take longer than expected. Spend the time needed to create your DNS, and give yourself plenty of time between the design and implementation phases, advises Hann, who says he wishes he had known more about Visual Basic scripts when creating his own policies at BancorpSouth. "It would have made my job so much easier," he says.

Get plenty of outside assistance, advises Cole. In addition to bringing in consultants, talking with peers at other companies can help smooth the process.

"We used to have conference calls with other companies sharing experiences," he says. "We could talk about struggles we were encountering. It was definitely beneficial." ◗

GLOSSARY

ACTIVE DIRECTORY (AD): Microsoft's trademarked directory service, which is an integral part of the Windows 2000 architecture and designed especially for distributed networking environments. Like other directory services, AD is a centralized and standardized system that automates network management of user data, security and distributed resources.

DOMAIN: In Windows 2000, it's a set of network resources (such as applications and printers) for a group of users and is the basic element to which a common security policy can be applied. The user needs only to log on to the domain to gain access to the resources, which may be on different servers in the network. Domains can be arranged into trees and subtrees.

DOMAIN NAME SYSTEM (DNS): A hierarchical distributed database for name/address translation. AD uses DNS as its location service, so clients can find domain controllers via DNS queries.

ORGANIZATIONAL UNIT (OU): An AD administrative partition that allows for further breakdown of administrative functions within a domain. OUs can aggregate users, groups, resources and other OUs into a single logical group for administrative purposes.

Quick Link

ONLINE EXCLUSIVE
■ Users who have been there share seven practical tips to help you achieve a more successful Active Directory design.
www.computerworld.com/q?24008

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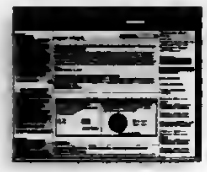

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How to Lock Down Windo

The system may be complicated, but there are some simple steps to secure it. By Dan Verton

LUDA LUKOVA

WINDOWS 2000 SERVER, Microsoft Corp.'s premier network operating system, isn't a tool you get to know all at once. Because of security concerns, many users find they must spend time getting fully acquainted with the complicated and robust platform before considering an enterprise rollout.

Introduced in February of last year, Windows 2000 Server now offers a bevy of new security features, including certificate services and Kerberos network-authentication services. It also comes with new wizards and tools to help administrators with installation and security settings. But the complexity built into the operating system's 30 million lines of code makes securing it all the more difficult. Here are some practical things administrators can do to lock down Windows 2000.

Match Security to Business Needs

THE PROBLEM: Like all operating systems, Windows 2000 isn't secure right out of the box. The tendency among most administrators, say experts, is to simply click the Install All icon. But with an operating system as complicated as Windows 2000, that may prove more challenging from a security perspective than some can handle.

"When they click Install All, they turn on all of the sample code and demonstration programs and all of the problems that come with those," says Chris Rouland, director of the X-Force vulnerability research unit at Internet Security Systems Inc., a consulting firm in Atlanta.

"It would be nice if all software vendors produced

software with default values that leaned toward security and lack of functionality, as opposed to less security and more functionality," says Marty Lindner, an incident-handling team leader at the CERT Coordination Center at Carnegie Mellon University in Pittsburgh. Related to this out-of-the-box functionality is the fact that Windows 2000 added many independent features that are secure in stand-alone mode but that can create more holes if implemented poorly as part of the Windows 2000 environment, says Lindner. Recent examples include the holes discovered in Microsoft's Internet Information Server (IIS). Although it's a separate product, IIS is tightly integrated with Windows 2000. "IIS can only run on Windows, so in that sense, it is tightly coupled to the Windows environment. But implemented poorly, it can get you in a lot of trouble," he says.

THE FIX: Rouland suggests that users separate their Windows 2000 servers logically by function (for example, file servers, print servers and e-mail servers) and then install and activate only the features and services that are required for that system and that match the security level required by their businesses.

Stay Up to Date With Patches

THE PROBLEM: Managing security patches, vulnerability alerts and service pack releases has become one of the major challenges facing all systems administrators. Although there are many vendor and independent security organizations, including Microsoft, that offer automated patch-notification services, users still face the daunting task of keeping track of what they've installed.

"The biggest issue with Windows 2000 machines is keeping the patches up to date," says Mandy Andress, president of ArcSec Technologies Inc., a consultancy in Dublin, Calif. "The biggest reason why many organizations do not stay up to date with their patches is they are afraid that installing the patch will create a problem and their systems will not function properly," she says. "This is why testing patches before installing them in a production environment is a best practice that needs to be followed."

What problems can this cause? One of the biggest has been when a security patch unravels security protections installed previously by either other patches or service pack releases. Likewise, service packs can reverse the benefits of security patches.

"The largest issue here is human error," says Scott Culp, a program manager on Microsoft's security team. Users should have a plan and test things before deploying them, he says. Microsoft's Secure Windows Initiative is making a concerted effort to "get better about the quality of the patches that we release and ensuring that they don't have side effects," says Culp.

Comfort Levels

When it comes to Windows 2000 security concerns, users fall into three categories:

Holding Back. "We have been recommending that our clients not upgrade to Windows 2000 yet, mainly for security reasons," says Tim Gotham, president of Premier Design Systems Inc. in Minneapolis. "We are just not comfortable recommending and upgrading these mission-critical systems to a platform that appears to be full of security holes."

Slow and Cautious. "We are taking the slow and cautious approach [due to concerns about security]," says Kevin Doyle, a security administrator at Pennsylvania State University in State College. He says the school's deployment, started last year, should be done next year.

Full Steam Ahead. Other users and experts say that Windows 2000 is no less secure than any other operating system and that administrators must ensure that they deploy the right configurations, with the right security settings for their company's business. If done right, Windows 2000 can be secured, they say.

"I don't see any problems with the security issues," says Eric Johansen, a systems administrator at ReliaStar Life Insurance Co. in Minneapolis. "Part of my job is to ensure I am up to date on all security issues related to the software I administer," says Johansen, who's been working with Windows 2000 since before its launch.

– Dan Verton

"Microsoft security patches have been known to break third-party applications," says Keith Morgan, chief of information security at Terradon Communications Group LLC, a Nitro, W.Va.-based content-management company.

THE FIX: Microsoft has released free tools designed to improve patch management, says Culp. Microsoft Personal Security Advisor scans a system, indicates which patches are needed and recommends how to make the system more secure, he says.

Another tool, Hfnetchk, is built for administrators who monitor large server farms. "It comprises the total of the world's knowledge about Microsoft security patches . . . and it even understands what patches supersede others," says Culp.

A Windows 2000 tool called Qchain allows users to install a string of patches together, instead of installing them individually, says Morgan. Administrators should take advantage of this feature for deploying patches, he says. "This can be a major time and productivity saver and also helps to take the user out of the picture," Morgan adds.

Lindner recommends that users check the authenticity of the patches they install. Although a CD may say "Microsoft" on the label, there have been isolated cases where the authenticity of the source has been questioned, says Lindner. "You need to verify the integrity of the patches you are downloading. You can't trust things at their face value."

Shield the Administrator Account

THE PROBLEM: Hackers who gain administrative access to a network can cause great damage to systems and mission-critical data. They can delete information, change file directory structures, install malicious code and conduct a host of other attacks.

THE FIX: You can make it impossible, or at least very difficult, for hackers to gain access to your network and the almighty administrator account if you know what services you have running, know what applications are running on top of your operating system and closely manage user and administrator accounts.

For example, Morgan creates a user account to run only IIS services, which have proved to be a major vulnerability in recent months. He then places appropriate restrictions on the service account. "What we try to do is mimic a Unix-style environment, where a service account has its own file system and security environment," says Morgan.

Microsoft, however, already offers two IIS-specific tools for Windows 2000, says Culp. One, IIS Lockdown, interviews users and automatically shuts off all nonessential services. The other, URL Scan, keeps an automated lookout for requests that users define as unusual and then throws away any server request that matches the profile.

Andress says there's no single thing an administrator can do to protect the administrator account from being compromised. Strong perimeter security, patch management, cutting off all nonessential services and monitoring and auditing are all key, she says. Automated tools only get you so far, says Andress.

Lyndner agrees. "You can also have a patched machine but do really stupid things, like store scripts in unprotected directories that allow people to run them without permissions," he says.

When it comes to locking down Windows 2000, automated tools make your life easier if you know what you're doing, says Lyndner. "But if you rely on the tools to help you to know what you are doing, you're destined to fail."

ws 2000

Quick Link

ONLINE EXCLUSIVE

■ For a task list of security lockdown techniques, from basic to advanced, check out: www.computerworld.com/q?24840

DAN KABERON, parallel sysplex manager at human resources outsourcer Hewitt Associates, says the z/OS upgrade will result in "stupendous" software savings.

z/OS: Users Expect

IBM's new mainframe operating system promises big changes in software pricing and more.

By Jaikumar Vijayan

UPGRADES of mainframe operating systems don't usually generate much excitement. But users say IBM's z/OS — the new version of OS/390, introduced in October of last year — is different.

Not only does it marry the old mainframe disciplines with the distributed server world, but it also promises big changes in software pricing.

The new z/OS metering technology — and the resulting new pricing model — could sharply reduce the cost of applications for mainframes. Naturally, that has IT managers ecstatic. "Stupendous savings," predicts Dan Kaberon, parallel sysplex manager at Hewitt Associates LLC in Lincolnshire, Ill. "The software savings will substantially exceed the cost of the new mainframe hardware that we have installed this year."

Hewitt, a large mainframe user, is one of the country's biggest human resources outsourcers. The company has installed six of IBM's new z/900 mainframes so far this year.

The excitement is understandable because IT managers have complained for years about the current mainframe software pricing models. And software costs have beeo a crucial factor in driving applications off mainframes in the past several years.

Z/OS enables what IBM calls a Variable Workload License Charge, which will allow mainframe users to pay for software based on the size of their workloads, not on the overall capacity of their systems.

This support for subcapacity licensing is crucial. Mainframe users have criticized the unfairness of capacity-based license models that tie software prices to the size of a system — the bigger the system the more the software costs.

"It's like buying a Cadillac seat cover and being asked to pay the price of a full Cadillac," says Harry Roberts, CIO at Boscov's Department Stores Inc. in Reading, Pa.

With z/OS, IBM has laid the groundwork for an alternate pricing structure under which the cost of software will be lower than or equal to current pricing models for the same capacity, says Pete McCaffrey, program director of IBM's enterprise server group.

Key to this is an upcoming z/OS feature called the IBM License Manager (ILM), which essentially gives IBM and other software vendors a license compliance tool to monitor customers' average software usage and then charge them based on that, he says.

Once installed oo a mainframe, the ILM monitors the average use of a piece of software over four-hour periods and relays that informatioo back to IBM or third-party software vendors. If a customer's average use during a given four-hour period exceeds the current licensed capacity, that customer will he required to pay additional fees.

The result: Users will be able to license software based oo expected average workloads rather than oo peak workloads, McCaffrey says.

To qualify, customers must first move to IBM's zSeries 900 mainframe hardware and run the z/OS operating system in full 64-bit production mode. And major third-party mainframe software vendors also have to agree to license their software in this manner for subcapacity pricing to really make a difference. Traditionally, major software

vendors have dragged their heels when it has come to supporting new pricing models, so their support will be crucial.

Alas, ILM was supposed to have become available by September, but its availability has been pushed back to the first quarter of next year.

In the meantime, IBM has made available an interim, downloadable Workload Capacity tool that will allow users to take advantage of subcapacity pricing. But it doesn't have the same license compliance-monitoring feature that ILM will deliver.

Blending Old and New

But z/OS is about more than just new software pricing (see box, at right). A lot about the operating system — such as its wide range of system services, and its integrated database and transaction monitors — plays to traditional mainframe strengths, says David Floyer, an analyst at IT Centrix Inc., a mainframe consultancy in Mountain View, Calif.

At the same time, its 64-bit architecture, sophisticated new resource-sharing and dynamic workload management capabilities, enhancements in IP networking, and growing Linux and Unix support make the mainframe more acceptable in distributed server environments as well, Floyer says.

"With the z/OS, IBM is trying to make sure users can get as much as possible from [open] environments without losing the core competencies of mainframe technology," Floyer says.

For instance, the ability to dynamically add memory and capacity to applications that need them makes for far more efficient use of hardware and network resources, says Jerry Skaggs, vice president of IT operations at United Parcel Service Inc. in Mahwah, N.J.

The company has 15 zSeries mainframes with a total installed capacity of more than 19,000 MIPS, accessing more than 175TB of mainframe and Unix storage data. The systems — each of which comes with up to 2,500 MIPS capacity and a much smaller footprint than IBM's previous mainframes — also make for great server consolidation platforms, according to Skaggs.

UPS is also investigating whether it would be more cost-effective to run some of its current Wintel and Unix applications in a Linux environment on mainframes, says Skaggs.

Boscov's has installed IBM's new z/900 technology not only to boost capacity for its traditional big-iron workload but also to consolidate applications from several Wintel servers, Roberts says.

During the next several months, Boscov's will migrate several core Wintel server applications, starting with its file servers and database servers, to a Linux environment running on a z/900 mainframe. The move should greatly reduce the "care and feeding costs" associated with running those same applications in an Intel-based server farm environment, says Roberts.

"Care and feeding" in a Wintel world requires about one technician for every 10 servers. Running the same applications on virtual Linux partitions on a mainframe could make it possible for one or two people to look after 45 servers, Roberts estimates. "The z/900 is much more than a mainframe. . . . It is an enterprise server that provides you with a very flexible [application] environment to run mainframe and server applications" side by side, he says.

The 64-bit support in z/OS is also important for most users, though more applications and middleware need to get 64-bit-enabled before they can take full advantage, says Steve Gilde, a director at ACI Worldwide Inc., an Omaha-based developer of software for automated teller machine (ATM) and consumer banking applications.

The 64-bit support allows more of an application's data to reside in system memory, where it can be accessed much faster than if it had to be accessed from disk. "If someone is in an ATM or checkout line, every millisecond counts. If we can push some of our critical data into memory, we can make that process faster," Gilde says.

Similarly, some of Hewitt's applications require several instances of the DB2 database — plus other subsystems such as CICS and Web server applications — to run on a single server. But because of memory addressability limits on previous operating systems, Hewitt had to split the subsystems over multiple systems. With a 64-bit environment, it's possible to run everything on one server, Kaberon says.

The z/OS mainframe heritage and its growing support for newer environments "makes all the sense in the world for us," says Roberts at Boscov's.

The company's existing investment in mainframes makes it crucial to continue upgrading that environment. Z/OS enables that to happen, he says, while also offering "a great answer to growing server farms."

What's New in z/OS?

IBM's z/OS blends traditional mainframe strengths with new management and resource-sharing features that are targeted at Web-enabled application environments. Among the core features in this regard are the following:

■ **Intelligence Resource Director (IRD) technology.** This gives the z/900 mainframe the ability to intelligently manage resources, such as memory or I/O, that are allocated to the partitions on a server.

Like previous-generation IBM mainframes, the zSeries lets users partition a single box into multiple smaller servers, each of which is capable of running a different application. Users are able to set priorities for each application. IRD then manages the partitions and is able to dynamically pull resources from a low-priority application and reassign them to a high-priority application as the need arises.

Such on-the-fly resource-sharing capabilities are made possible by functions such as workload management, physical resource balancing of processors, and dynamic channel path management capabilities that are built into IRD.

■ **HiperSockets.** This technology, which IBM calls a "network in a box," is unique to the zSeries. It enables fast TCP/IP communication between z/OS Linux for zSeries and z/VM partitions on a z/900 server. By eliminating the need for external networks to achieve this connectivity, HiperSockets improves application response times and reduces cost and complexity, IBM says.

■ **Security.** IBM is also making it safer to run Internet and intranet applications with new host-based intrusion-detection services and support for digital certificate and Secure Sockets Layer (SSL) services. Also available are user-defined cryptography functions and technologies for managing digital certificates and SSL services.

■ **New file system and compilers.** Applications that access very large sequential files will see improved performance with IBM's new zServer File System for z/OS Unix system services, IBM says. Meanwhile, a new C++ compiler is aimed at simplifying application porting to z/OS. Also built in is support for technologies such as Enterprise JavaBeans and XML.

– *Jaikumar Vijayan*

ONLINE RESOURCE

■ IBM's Web page on z/OS has specifications, white papers, security details and FAQs:
www-1.ibm.com/servers/eserver/zseries/zos

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KEVIN FOGARTY

Devilish Bargain?

THE REASON PEOPLE SO OFTEN COMPARE Microsoft to the devil isn't because it's a demonically effective competitor. It's because Microsoft so often gives people exactly what they want, then makes them sorry they ever asked. During the '90s, when interoperability among client/server operating systems was a major bugaboo, users asked for a standard platform on which to run e-mail, customer databases and other midtier corporate applications.

Microsoft gave them NT, which could do nearly all of the things users wanted it to do, but none of them terribly well. Plus, NT came with all the security and stability problems of Windows itself. But interoperability was worth the price, even if — as both users and vendors have found — when you hitch your wagon to Microsoft's train, you gain a lot of speed but have virtually no say about where you're going.

To its credit, of course, Microsoft has ramped up various versions of its server operating systems to the point that they're functionally comparable to most competitors' products. (With pluses and minuses, of course; they can't compete point-for-point with Unix, for example, but they're a good lowest-common-denominator choice for most noncore business applications.)

KEVIN FOGARTY is a former *Computerworld* editor. He can be reached at kevinjfogarty@yahoo.com.

Microsoft has adopted the strengths of its opponents so well that it now makes up 41% of the server market, according to IDC, while the market shares of most of its competitors are shrinking. The lone exception, Linux, succeeds mainly by avoiding direct competition with other products and by letting users make of it what they will, rather than adhering to software developers' expectations.

So it's interesting to see that, just as Microsoft delivers what users have always said they wanted, users are moving on to the next new thing.

Of course, the next new thing in operating systems turns out to be the last new thing everywhere else: Web technology.

According to a Gartner Inc. report amusingly titled "The Hype is Right" (surely a first in the hype-saturated tech market), Web services will soon form the primary platform of business computing, improving corporate IT's efficiency 30% by, among other things, eliminating the complexities of integration and making the Web itself a point of integration for both applications and organizations.

Though every major operating system has Web integration features, the real core of corporate computing, according to Gartner and others, will soon become not the platform on which the computing is done, but the Web-enabled points of integration among many applications. Integration brokers — middleware components built into operating systems, applications and stand-alone brokers like Microsoft's own upcoming BizTalk Server — are designed to create a computing environment in which the user needs to see only a nice Web interface, while brokers use XML, SOAP, Web Services Description Language, and Universal Description, Discovery and Integration, among other protocols, to exchange data clearly.

As always, building a web of applications that is both useful and easy to use will be more of a headache for IT than supporting a mishmash of incompatible software that can exchange documents only via FTP.

The 30% increase in efficiency that Gartner predicts Web technology will deliver is only for the IT projects, though. If the increase in the efficiency of the business processes that the technology supports is even half that, the investment will be among the best any organization will have ever made.

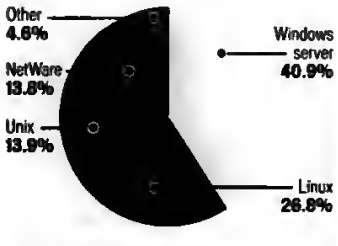
So what happens to Microsoft's market-dominating server operating system when the ability of applications to talk to one another becomes more important than the platform on which they run?

It becomes irrelevant, except to the administrators who support it and the developers who build applications on top of it.

And that may be the most diabolical part of the deal. Not only did it make users unhappily beholden to the one granting the wishes, but in the long run, it may also make the one granting the wishes unhappy. ◗

Server OS Market Shares

Worldwide new-license shipments for 2000:



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Managing OS Diver

Thin clients, open standards and management tools help control the mixed OS shop. By Drew Robb

DIVERSITY ISN'T AN ISSUE JUST for human resources departments. These days, it's a fact of life in most IT departments. Just ask Curt Allen, senior server architect at Central Maine Power Co. in Augusta, Maine.

Allen manages a network that includes IBM's OS/390 on the mainframe; IBM's AIX on RS/6000 servers; Windows NT 4 and 2000 for file and print sharing; Research Triangle Park, N.C.-based Red Hat Inc.'s Linux on Web servers; and a few OS/2 servers. Clients run several flavors of Windows, and there are some Macintosh workstations in market research and advertising, not to mention the handheld devices in the field.

"Staffing all the necessary skills in a multi-OS environment is a real challenge," says Allen. "As a result, I have to wear a number of hats."

His situation is far from unique. Many enterprises are adopting a best-of-breed approach to server operating systems, in which the companies pick the best environment for a particular situation and thus end up with multiple operating systems to manage. The rise of Linux is helping to drive that trend.

Although managing a mixed server operating system network requires a more diverse set of skills and tools than running a single environment, there are ways to limit the complexity. The growth of accepted standards and new interoperability tools make it possible to take a piece of hardware or software from any vendor and fit it into the network.

Workforce decentralization is playing a definite role in the adoption and tolerance of multiple server operating systems. California's Department of General Services, for instance, had to rethink its computing infrastructure due to soaring office space costs.

"We've been told to supply one-third of our staff with the ability to telecommute within the next one to two years," says Jamie Mangrum, operations manager for enterprise services in Sacramento.

But the department isn't set up to enter 6,000 employee homes to configure workstations and deploy software. For an agency already running Microsoft Corp.'s Windows, Novell Inc.'s NetWare and legacy programs, managing an additional batch of operating systems in employee homes requires a simple means of integration.

So the department implemented server-based computing using Windows 2000 Terminal Services (WTS), which allows applications to reside on the server so workstations don't need individual setup. With WTS, a seat license must be purchased for each user. But if the client will be accessing only the network through WTS, the price is about half the cost of a full Windows 2000 license.

WTS is based on Independent Computing System Architecture from Citrix Systems Inc. in Fort Lauderdale, Fla., which allows clients running Unix, Windows, Macintosh or Windows CE operating systems to access programs running on Windows or Sun Microsystem Inc.'s Solaris application servers.

In essence, WTS delivers a Windows 2000 desktop to remote computers or handheld devices via the keyboard or mouse input from the client and the display output from the application server. Thus, applications can be run remotely over low-bandwidth.

But the Citrix Metaframe/WTS rollout didn't go so smoothly at the government offices of Sonoma County, Calif. "Citrix has limited printer driver support, and we noticed unexplained slowdowns on Novell print servers with applications like GroupWise," says John Forberg, Sonoma County's IT director. To solve that problem, he abandoned network queues and installed a Windows print server on a file server.

Forberg mentions another problem. "Thin-client [computing] means users can't bring in floppies or CDs," he says, so it's not uncommoo to experience some user pushback. Nevertheless, he points out that this architecture saves money. "Users might not agree," he says, "but they doo't pay the bills."

A thin-client model isn't the only route to server operating system interoperability. Another popular approach is the use of standard protocols to bridge operating systems and applications.

William Zachmann, a consultant at Meta Group Inc. in Stamford, Conn., says, "XML offers a very broadly operable set of standards and protocols that can be used to communicate among online systems."

The use of TCP/IP instead of proprietary architectures has also reduced device dependency (when a particular device, like a Macintosh computer or a Palm Inc. handheld, requires a particular operating system). That's driving the rise of Web-enabled applicatioos.

Strategies

- Use **open standards** for easy interoperability
- Install tools that can simultaneously manage **multiple operating systems**.
- Adopt **thin-client** computing.
- **Web-enable** applications.

"We wanted a thin-client or device-independent architecture to make it easy to access corporate applications over the Internet," says John Townsend, manager of network operations at DTE Energy Inc. in Detroit. He chose Enterprise 3 software from Santa Cruz, Calif.-based Tarantella Inc. The software, wbich resides on its own Linux or Unix box, acts as a middleman by taking keyboard and mouse inputs from clients, converting them into the appropriate protocol and sending them to application servers. The Enterprise 3 box then receives data from the application, converts it to a Web document and sends it to the user. All the client requires is a browser.

DTE Energy primarily uses Unix for enterprise applications, but runs Windows NT on department-level application servers. A user goes to an internal Web page that contains a menu of applications, both Unix- and Windows NT-based. After clicking on the applicatioo and going through normal authenticatioo procedures, the Tarantella software launches the application.

Enterprise 3 also came in handy when DTE acquired a gas company in a different city. Townsend explains, "As we migrate them to the DTE site, they use Tarantella to access their corporate applications so we don't have to move the applications over."

Simplified Management

Although the integration of diverse server operating system elements can now be accomplished with relative ease, administration is another matter. If management of the network places a burden on IT, it can defeat the purpose of a thin-client or standards-based approach to running multiple systems.

Central Maine Power, for example, wanted to avoid the lengthy installation times and high cost often associated with enterprise management frameworks. "We ended up spending too much time managing and maintaining our previous high-end management software," says Philip Mourneault, the utility's networking specialist.

So Central Maine Power opted for WebNM, a low-cost (and partially open-source) network management system from Somix Technologies Inc. in Sanford, Maine. WebNM works in tandem with WhatsUp Gold network monitoring software from Ipswitch Inc. in Lexington, Mass.

WebNM monitors and controls SNMP-enabled devices through a browser interface. At Central Main Power, that includes all the servers, routers, switches, workstations, printers and SNMP power strips, even though they may be operating on any of a dozen server operating systems.

"WebNM doesn't give us the depth of information more expensive systems might provide, but it is more than adequate for our needs," says Mourneault.

Despite all the work it takes to integrate server operating systems, it's easier than before. "It used to be that each vendor had one or more proprietary architectures," says Meta Group's Zachmann. "Now it is basically down to IBM, Windows and Unix/Linux." He predicts that the market will continue to consolidate along the Windows and Linux platforms.

Framingham, Mass.-based IDC agrees. IDC figures show that 41% of server licenses issued last year were for Windows, and 27% were for Linux. Novell NetWare and Unix accounted for 14% each. IDC says that five years from now, multiple server environments will still be very mucb in evidence.

All signs point to an acceleration of the move to server-based, thin-client infrastructures and standards-based applications. California's Department of General Services, for example, began with one server, expanded to 14 servers and 350 users, and more are on the way. "I've been asked not to show WTS to anyone else," Mangrum says, "because people want it right away." ◗

Robb is a freelance writer in Tujunga, Calif. Contact him at drewrobb@mediazone.net.

Quick Link

ONLINE EXCLUSIVE

- Several new products allow Windows-based programs to run on Linux desktops. For a roundup, see: **www.computerworld.com/q?24837**

Linux

DEFINITION

Linux is a Unix-like operating system that was created in 1991 by Linus Torvalds for his own use. Since then, it has been continually refined by developers around the world. Although Linux is open-source software, it is available in myriad versions, called distributions, many of which offer commercial support.

BY TODD R. WEISS

A DECADE AGO, Linux was just a twinkle in the eye of its inventor, Linus Torvalds, a college student who wanted to create a better operating system for his own use. Today, Linux is gaining a growing share of the server market, expanding its presence in science and education and slowly making its way into mission-critical business computing.

Once just a cult operating system used by researchers, scientists and students because it could be freely modified to fit their needs, Linux is increasingly being seen as a realistic option for business computing. Among its business benefits is that same flexibility, which lets developers make changes ranging from altering core code to fit corporate needs to modifying its on-screen appearance to satisfy users.

So, where does Linux stand today? And what's still to come?

In 1999, Microsoft Corp.'s Windows accounted for 38% of server operating system shipments, compared with 24% for Linux, according to IDC in Framingham, Mass. Last year, Windows' share increased to 42%, and Linux's increased to 27%, both at the expense of Unix, Novell Inc.'s NetWare and others. Linux is the fastest-growing server operating system in terms of shipments, according to IDC.

SERVER OS SHOWDOWN

Linux use soared during the dot-com frenzy in the late 1990s, as start-ups with big dreams needed to get online quickly and reliably. Because Linux was either free or sold by companies that added their own features, support, manuals and simplified install routines, it was a perfect Web server platform for start-ups that needed high-tech capabilities at low cost.

Linux start-ups like Red Hat Inc. and Turbolinux Inc. took off, fueling what became a torrent of reliable, robust and relatively cheap Linux e-commerce deployments.

Meanwhile, Linux supporters believed there was still more in Linux's future than the three primary uses that were established at that point: for Web servers, file servers and print servers.

Backing for that view arrived in a big way when IBM announced a $1 billion investment this year for the continued development of the operating system. Compaq Computer Corp. and Hewlett-Packard Co. have also been strong Linux advocates, offering the operating system on wide segments of their server product lines. Such developments have given Linux wider credibility in the marketplace among IT decision-makers.

More Business Use

An increasing number of companies, from New York-based Cendant Corp. (see story, page 48) to Burlington, N.J.-based Burlington Coat Factory Warehouse Corp., have adopted Linux for their core operations. Cendant, which franchises more than 6,500 hotels, including the Howard Johnson International Inc. chain, uses Linux for its property management system, while Burlington Coat Factory uses it for its retail store operations.

Linux is also being increasingly used in high-performance scientific and research projects, including supercomputer clusters for oil and gas exploration, as well as medical and drug research.

A continuing criticism of Linux is that there's a shortage of business applications for it. While Microsoft Office isn't available, there are similar applications, such as Corel Corp.'s WordPerfect, Applix Inc.'s Applixware Office and Sun Microsystems Inc.'s StarOffice suite.

Linux's future got a lift in January when vendor-funded Open Source Development Lab Inc. opened in Oregon. The lab was established to help prepare Linux for expanded high-performance corporate data center use by working to fulfill key needs, such as improving the scalability of Linux to 16 processors or more, up from the four to eight possible today.

Last January, Torvalds released the long-awaited Version 2.4 kernel for Linux, adding a host of new features, including support for additional processors and a built-in logical volume manager to let all hard drives be seen as one seamless drive. Also included were power management and Universal Serial Bus support improvements.

Because there are different brands of Linux, from vendors such as Caldera International Inc., MandrakeSoft SA and SuSE Inc., the Linux Standard Base was formed last year to create compatibility standards to ensure that applications will be able to run on any distribution. ◗

Quick Link

ONLINE EXCLUSIVE

■ Take a historical look at Linux's debut in 1991:
www.computerworld.com/q?24693

Major Linux Operating System Vendors

Though you can usually download Linux for free from myriad Web sites, vendor companies offer boxed software complete with extra applications, manuals and support for a fraction of the cost of proprietary operating systems. The following are the major distributions, along with their most recent versions:

Name	Version	Distributor	Platform	Comments	Web
OpenLinux	3.1	Caldera International Inc. (Orem, Utah)	Intel		www.caldera.com
Debian GNU/Linux	2.2r3	Software in the Public Interest Inc. (Tracy, Calif.)	Alpha, Intel, PowerPC, SPARC, 68000	The largest developer community	www.debian.org
Red Hat	7.2	Red Hat Inc. (Research Triangle Park, N.C.)	Alpha, Intel, SPARC		www.redhat.com/software/linux/
SuSE	7.3	SuSE Inc. (Oakland, Calif.)	Alpha, Intel, PowerPC (PPC)		www.suse.com
Turbolinux	6.5, 7	Turbolinux Inc. (Brisbane, Calif.)		Based on Red Hat, concentration is on server versions	www.turbolinux.com
Mandrake	8.2	MandrakeSoft Inc. (Altadena, Calif.)	Alpha, Intel, SPARC (and soon PPC)		www.linux-mandrake.com
Slackware	8.0	Slackware Linux Inc. (Concord, Calif.)	Alpha, Intel, SPARC	Once the most popular version	www.slackware.com

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Linux Checks In At Hotel Chain

Cendant picks Linux app for vital property management chores.

By Todd R. Weiss

ONE OF THE OFT-HEARD knocks against Linux is that it lacks big-time business applications. Try telling that to Cendant Corp., one of the world's largest hotel franchisers.

When the $4.6 billion New York-based company modernized systems at thousands of hotels three years ago, it chose an application that ran only on Linux. FrontClerk, the property management application from Hotel Software Systems Ltd. in Portland, Ore., stood out from available Windows-based products at the time, according to Jeff Daniels, Cendant's director of franchise technology.

Others in the industry took notice of Cendant's Linux approach. "It's gigantic for two reasons," says Frederic Lalonde, chief technology officer at Newtrade Technologies Inc., a travel industry IT vendor in Montreal. First is the fact that it's Cendant, "not some backwoods company in Nebraska that's choosing Linux because they don't have any money," he says. "[Cendant] can buy any software licenses they need."

Equally important for Linux's credibility inside the enterprise, says Lalonde, is the fact that for hotels, property management applications are "the brains and heart of the properties," keeping track of rooms awaiting housekeeping, billing for in-room movie rentals, telephone calls, minibar use, guest check-in and check-out, reservations and more.

Besides, Lalonde observes, "under Linux is Unix — end of story. It still is a very robust Unix environment."

Before the modernization project was launched in 1998, most of Cendant's hotels either didn't have a computer or had separate on-site systems. Today, all of its 6,500 hotels in nine chains use Linux-based FrootClerk. Although the company had a choice among Linux distributions, it chose OpenLinux 2.3 from Caldera International Inc. in Orem, Utah. "We've been pretty pleased with the product from Caldera, from the stability of the operating system and the support that we've been able to garner," Daniels says.

One of the other critical features that open-source Linux allows is broad customization for Cendant's hotels. That flexibility, for instance, allowed modifications to make the virtual private network code work with the existing central reservatioo system. It also allowed modifications to the operating system kernel to remove unneeded features at each hotel. That essentially protects hotel workers from inadvertently making system changes and causing problems, says Norman Wall, a Cendant technical support specialist. That's especially important at locations where the technical support staff isn't on-site.

"We have the ability to coofigure our own firewall," a feature unavailable on Windows three years ago, Wall says. And "for a hotel that really needs to communicate on its network, we can really get into the code," he adds.

Easier Administration

Under Linux, other systems administratioo tasks are also easier, Wall says, including automating processes using languages such as Perl and Python. For example, fixing printing problems can now be done easily using a short script under Linux, be explains.

The hotels are running Linux oo Intel-based servers and workstations from IBM. These are linked at eacb site using serial connections, witb three to seven workstations at eacb locatioo for use by front-desk clerks, housekeeping staff, accountants and managers.

Cendant continues to work with Caldera to automate the distribution of updates, applications and system maintenance, so it can be done from a remote location for any of the company's hotels. Under the existing system, updates and fixes are sent via e-mail or courier and are then installed by hotel staffers, most of whom lack technical experience. At times, though, Cendant sends a technician out to deal with problems in person, adding to maintenance costs.

Linux hasn't provided Cendant with all the answers, however. Some franchisees require access to the business-standard Microsoft Office applications available under Windows, so separate Windows PCs must also be provided.

"Linux simply didn't offer a viable solution to several of these requirements from our franchisees," Wall points out. Cendant considered Sun Microsystems Inc.'s StarOffice suite but found that it didn't fully meet the needs of its users. Many of the botels also use accounting software that's only available for Windows, he says.

Lalonde says Cendant's success with Linux for its mission-critical property management system is just the start. "I can predict right now that you will see more and more of this," Lalonde says. "As companies like Cendant embrace this, it will gain even more credibility."

CENDANT IS PLEASED with OpenLinux's stability and Caldera's support, says Jeff Daniels (right), pictured here with Cendant support specialist Norman Wall.

Cendant Corp.

- **Business:** Conglomerate that owns midmarket hotels; the Avis rental car business; time-share resorts; travel services; Century 21 and Coldwell Banker real estate brokerages; mortgage and relocation services; and the Jackson Hewitt tax-preparation service
- **Employees:** 28,000
- **Hotels:** 6,400 (nearly 540,000 rooms) on five continents
- **Lodging brands:** Amerihost Inn, Days Inn, Howard Johnson, Knights Inn, Ramada Inn, Super 8, Travelodge and others

SOURCES: HOOVERS.COM, CENDANT.COM

Need a Linux Diploma?

Certification is a nice bonus, but it's not a must-have in the job market. By Julekha Dash

AS MORE COMPANIES ADOPT LINUX, the demand for workers who know the ins and outs of the operating system will grow. Market research firm IDC in Framingham, Mass., reports that Linux's share of the operating system market blossomed from 13.5% in 1999 to 27% in 2000.

But does certified training in Linux help IT careers? While it can be professionally rewarding, certification doesn't necessarily make or break hiring decisions, according to IT workers and analysts.

Jayson Kern, an IT contractor at Garland, Texas-based CMC Network Solutions, last year earned a Level 1 Linux certification, which tests competency in installation and configuration of the operating system, from SAIR Linux and GNU Certification in Oxford, Miss. SAIR, a unit of Thomson Learning, part of electronic information provider The Thomson Corp., offers Linux certification exams that test proficiency in network connectivity, systems administration and security.

IT CONTRACTOR JAYSON KERN says getting Linux certification was worthwhile

Kern, who does contract work as a network administrator, says his employer didn't sponsor the certification; he decided to pursue the extra training on his own. "It was all self-motivation," he says. With no background in Linux prior to preparing for the exam, Kern says, getting certified was worthwhile.

"Linux is the most perfect operating system," he says. "It never crashes. We will see a lot more [companies] looking for an alternative to Windows."

Methods for Linux certification vary, from instructor-led training to self-study using books or CD-ROMs. Instructor-led training is the most expensive, costing thousands of dollars per course. Kern, for example, spent $2,500 for SAIR's monthlong session. Other organizations that offer Linux certification include the Computing Technology Industry Association in Lombard, Ill.; Toronto-based Linux Professional Institute (LPI); and Research Triangle Park, N.C.-based Red Hat Inc.

Cramming for the Test

How much training an IT worker needs to become certified depends on several factors, says Stacey Quandt, an analyst at Cambridge, Mass.-based Giga Information Group Inc. A key factor is how much prior training the individual has had with Linux specifically and technology in general, as well as the level and type of certification that person is seeking. SAIR, for instance, offers four levels of certification, and LPI offers three.

Someone who has been certified has a more disciplined methodology for solving technical problems, says John Grana, vice president of software engineering at Performance Technologies Inc. in Rochester, N.Y. The company, which makes products for IP networks, uses Linux for more than 80% of its products, says Grana. Because it relies so heavily on Linux, an engineer or systems administrator would have a big advantage with certification, he says.

Though none of the company's 30 IT employees who work with Linux is certified, Grana says he would consider sending some to a certification training course if travel budgets weren't so tight and resources so scarce. "It's not like a year and a half ago, when you had extra hands," he says.

But while Linux certification would be "a feather in a cap" of any new hire, Grana says, he's not sure it should be a requirement. A good developer who has experience in Unix can easily make the transition to Linux if he's paired with other good engineers, says Grana. When hiring Linux systems administrators, Performance Technologies looks for workers with experience with Solaris as well as Linux, he says.

Rich Smrcina, a data center manager at Milwaukee-based Grede Foundries Inc., which makes metal castings, says he isn't sure Linux certification would be a selling point for a new hire. "It depends on the person" and whether the candidate demonstrates other skills, like the ability to work with others and learn quickly, he says.

Grede implemented Linux as the front end to IBM System 390 mainframes nearly two years ago. Smrcina says he and his colleagues gain their Linux knowledge through books published by Sebastopol, Calif.-based O'Reilly & Associates Inc.

"Certification isn't bad, but experience always beats certification," says David Foote, chief research officer and president of Foote Partners LLC, a Canaan, Conn.-based workforce consultancy. "Having both is best."

Dash is a freelance writer in Charlottesville, Va.

Does It Pay?

Linux skills are clearly in demand, but opinions vary regarding whether certification has any impact on salary. Dallas-based IT contractor Jayson Kern, for example, says he hasn't noticed any effect in his pay as a result of getting certified through SAIR Linux and GNU Certification.

But Stacey Quandt, an associate analyst at Giga Information Group, says that because certification "demonstrates a level of competence," IT workers can use that as a bargaining tool when negotiating salary. For instance, Tobin Maginnis, president of SAIR Linux and GNU Certification, says some of his students at the University of Mississippi received $500 boosts to their annual salaries after becoming certified.

David Foote, president of workforce consultancy Foote Partners, says Linux certification can lead to a 5% to 7% increase in pay, slightly less than the average certification pay increase of 8.4% of base salary.

But getting certified can offer other kinds of payback, such as choice work assignments, says Kern. For instance, Kern was recently assigned to a Novell-to-Linux migration project at an engineering firm – an assignment he says he wouldn't have gotten had he not been certified.

– Julekha Dash

Quick Link

ONLINE EXCLUSIVE

■ For a collection of resource links for learning Linux, visit the *Computerworld* Web site:

www.computerworld.com/q724826

NICHOLAS PETRELEY

The Source Is Everything

I PREDICT THAT LINUX will eventually be at the foundation of nearly every enterprise system and that the whole issue of which server operating system to choose will then disappear into ambient background noise. It's not often that I make predictions about predictions, but because the above prophecy is so bold, I'll make an exception: I predict that this will turn out to be one of the easiest predictions I've ever made.

Here's why this prediction will come true: While there are many technical challenges ahead for Linux, there is one overriding factor that makes Linux virtually unassailable by all closed-source competition: Your investment in Linux is protected by the best software warranty on earth, the GNU General Public License.

Here's when the turning point will occur. One IT decision-maker — someone somewhere in Fredonia, Iowa, I'm guessing — will have the epiphany that he has been asking the wrong question about how to protect his company's software investments. You know the question: "Will this vendor be around to support my installation 10 years from oow?" That person will represent the tipping point of all IT decision-makers, and then the revolution will come.

The revelation that awaits these folks is that this question is absolutely meaningless when it comes to closed-source software. All closed-source software is a time bomb. Anyone who doesn't hear the ticking is in denial. There are only two types of closed-source software vendors: those whose software becomes obsolete and impossible to support, and those whose software becomes obsolete and impossible to support but that have a better sales strategy. The former group consists of veodors that will go out of business. The latter group includes vendors that will be in business 10 years from now because they've convinced enough customers that the last software version tbey were using is now obsolete and impossible to support, so they should invest in the new version.

This makes for a delicious paradox if ever there was one. The longevity of a compaoy may be proportional to its market share, but it's inversely proportional to how soon your software will become obsolete. Microsoft's attempt to move to a subscription-based software model is a perfect example. The company is basically saying, "We're going to make your software obsolete so often that you might as well just pay us for 10 years' worth of software upgrades upfront and get it over with." Any company with less than 90% market share would be laughed off the face of the earth for suggesting that. And that may be just the reaction Microsoft gets. But it couldn't even float the idea if it didn't already own the desktop.

Here's wben the prediction will come true. Once that Iowa guy comes on board, IT decision-makers will begin to ask the right question: "Do I get the source code and the right to modify and redistribute it at will?"

Linux and most of the code that makes Linux useful are licensed under the GNU General Public License, which means you're guaranteed to have access to the source code no matter what happens to the company that produced your flavor of Lioux. This means that there's no such thing as a doomsday scenario for Linux.

Assume, for the sake of argument, that all Linux distributors went out of business and that even the all-volunteer projects like Debian ceased. So, what would happen when your next hardware upgrade broke the Linux kernel? Nothing much. You'd have the source code and every tool you'd need to fix the problem. All you would need is a programmer. If that sounds unpleasant, imagine what would happen if Microsoft folded and your next hardware upgrade broke Windows. Without the source code, you're basically out of luck. Of course, this is purely hypothetical, because you'd already be paying half your staff to deal with tbe consequences of the latest migration to the next version of Windows.

My prediction is reliable for other reasons. For example, unlike Microsoft Certified Systems Engineer graduates, Linux experts have complete control over their own value to a company. Nobody can decertify a Linux expert, because nobody can claim exclusive ownership of the intellectual property they learn. Every reason I can cite to support this prediction points back to the same issue — having access to the source code.

So if you happen to be that IT decision-maker in Fredonia, Iowa, please let me know when you come around, so I can pass it on that the revolution has passed the turning point. ▶

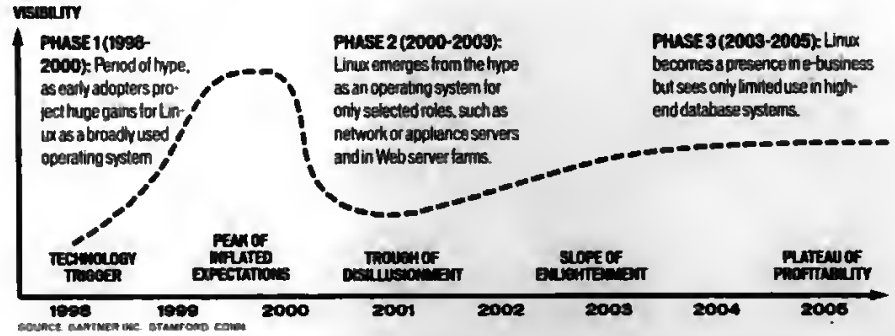
Other Linux Views

LINUX MOVING UP

"The development of Linux is moving faster than any other commercial operating system to date – so fast, in fact, that it will leapfrog Windows to replace Unix on the high end within the next seven or eight years. That means Linux, z/OS and Windows will be the primary server OSs before the end of the decade.

BILL CLAYBROOK,
ABERDEEN GROUP INC., BOSTON

THE HYPE CYCLE


VISIBILITY
PHASE 1 (1998-2000): Period of hype, as early adopters project huge gains for Linux as a broadly used operating system
PHASE 2 (2000-2003): Linux emerges from the hype as an operating system for only selected roles, such as network or appliance servers and in Web server farms.
PHASE 3 (2003-2005): Linux becomes a presence in e-business but sees only limited use in high-end database systems.
TECHNOLOGY TRIGGER
PEAK OF INFLATED EXPECTATIONS
TROUGH OF DISILLUSIONMENT
SLOPE OF ENLIGHTENMENT
PLATEAU OF PROFITABILITY
1998
1999
2000
2001
2002
2003
2004
2005

SOURCE: GARTNER INC., STAMFORD, CONN.

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Provide broad technical support for the development and enhancement of service applications and the Message Bus infrastructure that supports those services. You will collaborate and consult with application teams on the overall conceptual integration design, standards and rules, as well as participate in project design reviews. You should possess expertise in Java/VisualAge, XML, Websphere, UDB/DB2, UNIX/AIX, and UML/Rational Rose along with skills in OO analysis and design. Knowledge of the MQ Series, IBM's IAA BOM/XML, COBOL, IMS/CICS would be a plus.

System Engineer Specialist

Novato, CA

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Provide high-level technical leadership and mentoring for a team of Systems Engineers while working closely with management to define system improvements and deployment strategies. Your technical responsibilities will include enhancement and maintenance of the Message Bus, the Report Ordering Interface, and additional enterprise applications as they are identified. As new initiatives are approved, you will take an active part in the design, development and deployment efforts. You should possess in-depth knowledge of OO analysis and design. Java/VisualAge, Websphere, UNIX/AIX , UDB/DB2, UML/Rational Rose, Servlets, MQ Series, JSP, and EJBs as well as IBM's IAA BOM/XML. Six years' experience is required in full life cycle development including estimating and planning. We prefer 2+ years' experience in web architectures.

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IT Careers in Retail

Information technology has been a major factor in holiday shopping for the past two years, and its role in 2001 is expected to grow still further as retailers find new ways to serve customers when, where and how they want to shop.

Circuit City Group, based in Richmond, VA, is rolling out a major new customer service with **Amazon.com** as part of its holiday planning. **Amazon** customers will be able to shop for products available in more than 600 **Circuit City** stores, order the items through **Amazon**, and pick up the products instantly at their local **Circuit City** store with no shipping charges. **Circuit City** products purchased through **Amazon** can be returned at any **Circuit City** store.

Dennis Bowman, **Circuit City** senior vice president and CIO, says this is just one of several new developments in place to handle the holiday rush. Earlier this year, the MIS group implemented a new customer relationship management application. "This has made a tremendous impact on improving our customer satisfaction levels and the productivity of our customer care centers," Bowman says. **Circuit City** also worked the supply chain, combining hundreds of small fixes and enhancements to improve operations, from forecasting to recovery.

Circuit City continues to move to JAVA as a standard development language. "This has allowed people in our MIS group to cross platforms and transfer into other teams more easily," Bowman explains. This will be important as **Circuit City** moves forward with a new point-of-sale system that will provide touch-screen displays and side-by-side product comparisons. On the operational side, MIS staff are improving register printer operation and delving deep into operating systems and hardware technology, including the new Intel Itanium processors. "We don't confine truly state-of-the-art work to an R&D organization; it's part of a well-funded, mainstream IT effort," Bowman says.

While no major expansion is planned, Bowman continuously looks for talented people who have experience with JAVA, object-oriented, ASA400RPG, PeopleSoft, Microstrategy and Cisco. "We want people who are heavy in their ability to work in teams and who are leaders. We can provide a lot of important training, but the ability to motivate technical professionals is a skill that opens huge opportunities for an individual," says Bowman. "The bulk of time in any project is spent figuring precisely what needs to be done – these skills are hugely important to shortening this phase.

"The type of work, the environment, the challenges – our environment means you'll be able to make a significant contribution here," Bowman says. "If you have a great idea, we want you to volunteer to lead the way."

For more job opportunities with retail firms, turn to the pages of ITcareers.

▪ If you'd like to take part in an upcoming ITcareers feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.
▪ Produced by Carole R. Hadden
▪ Designed by Aldebaran Graphic Solutions

Computer/Info Systems

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Key Computer

Ascential Software has job opportunities in the following locations: California (Los Gatos, Oakland, and other locations) and Massachusetts (Westboro):

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For immediate consideration, send your resume with salary requirements to:

Ascential Software Corporation
50 Washington Street
Westboro, MA 01581

Or email to:
staffing@ascentialsoftware.com

See our website for additional openings.
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EOE
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CTC Corp has immediate multiple openings for exp'ed IT professionals in the following areas (various skills combination reqd.): XML, AtgDynamo Unix, JBuilder, Informix, Rational Rose, UML, VB, SQL Server, DB-2, Able Commerce, Java Script, WDDX, Cold Fusion 4.0 Server, Web Logic, Oracle 7.x/8i, iMerge, LADP, C/C++, XACCTusage 3.4, Clearquest/Clearcase, SQA Suite, WinRunner, LoadRunner, TSO, Dreamweaver Ultradev, Index Server, MTS, WebServer, Blue Stone, Sapphire, XLS, JSDK, FoxPro, Drumbeat 2000, etc. Pay commensurate with exp, foreign equiv. of educ. and/or combination of educ/exp will be accepted. Travel/relocation reqd. Resumes & salary expectations to: HR, 1845 Watkins Street, Suite #2, Bethlehem, PA 18017 or 1 Possumtown Road, Piscataway, NJ 08854.

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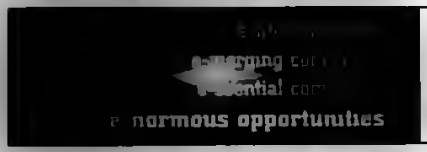

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F/T Sr Programmer Responsible for creating, customizing & designing software & object module components, object designs & flowchart systems according to specific design specifications or user's needs, using Oracle Reports & Order Entry Forms using Server-side stored procedures and Oracle Developer 2000 Migrate Oracle 7.x, test, debug & maintain programs & code instructions working w/PL/SQL. Update, repair, modify & expand existing programs. Must have Bachelors degree in Computer Science, Computer Engineering or related field. Foreign degree equivalent accepted. Must have 2 yrs exp. in job offered or position w/ same duties. Send Resume to Kathleen V. Spencer at 1932 Wynnton Rd., Columbus GA 31999

F/T Sr. Software Architect. Responsible for planning and developing firmware and adapter ROM for intelligent adapter cards for management product using embedded RTOS. Handle low-level hardware programming using x86, i960 Assembly Language. Conceptualize and scope out the projects and its necessary elements. Architect and develop modules of the project using C/C++ for Windows NT, UNIX, and DOS. Develop drivers and services for various operating systems. Must have a Bachelor's degree in Computer Science or foreign degree equivalent. Must have 4 yrs of exp. Salary: Competitive. Send resume to: Shvetsen Ramachandran, AMI, 6145F Northbelt Pkwy., Norcross, GA 30071

Senior System Engineer wanted by optical networking system developer in Oceanport, NJ. Must have Bachelor's Degree or equivalent in Electrical Engineering, Communications Engineering, or related field and 3 yrs. experience in job offered or in Systems/Test/Applications Engineering. Respond to Doreen Connors, HR Department (refs 015), Tellium, Inc., 2 Crescent Place, Oceanport, NJ 07757.

SENIOR SOFTWARE ENGINEER

To research, design, develop and test computer software systems for financial and banking applications. Analyze software requirements to determine feasibility of design and evaluate interface between hardware and software operations. Develop and direct software system testing procedures, programming and documentation using knowledge of C++, Java, XML, Oracle SQL server WIN32, API, CORBA (Common ORB Architecture), WEB Sphere, Rational Rose, Unix, and object oriented design and development. Requirements: Masters Degree in computer science or related field and four years experience as a software engineer or computer programmer. Two years experience in financial and banking applications and knowledge of C++, Java, XML, Oracle SQL server, WIN32, API, CORBA (Common ORB Architecture), WEB Sphere, Rational Rose, Unix, and object oriented design and development. Salary: $87,000/yr. Working Conditions: 8 a.m. to 5 p.m., 40 hrs/wk. Apply Director, Pittsburgh/Allegheny Co. Career/Link, ATTN: JS Supervisor, 425 Sixth Ave., Ste 2200, Pittsburgh, PA 15219. Refer to Job Order No. WEB 211230.

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GE Card Services is a leader in providing credit services to retailers and consumers. Formed in 1932 as a provider of consumer financing for GE Appliances, Card Services provides private label credit cards, commercial programs and card-related financial services for hundreds of retailers and manufacturers across North America.

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Qualifications:

- A B.S. in Mathematics, Statistics, Operations Research or technical equivalent and 2 years' experience in field.
- Must have demonstrated ability with data extraction and warehousing tools (SAS, JCL, Easytrieve and Oracle on Sun 10000 Unix platform).
- Also required is experience with analytic tools and applications, specifically X11, multivariate and discriminant analysis, multiple and logistic regression, and statistical tools and applications, specifically "Evolver," Crystal Ball, and CHAID.

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SoftPros, Inc., an Atlanta, GA based corporation needs IT professionals, with a minimum of two years of industry experience in any/combination of the skills sets below:

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- Oracle 8i/8 0/7.3x/Developer 2000/Designer 2000/PL/SQL/Versant 5.2/Ingres
- Sybase/PowerBuilder/Oracle
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Travel required.

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F/T Software Applications Engineer. Responsible for developing, designing & modifying computer software applications as well as testing & maintaining new & existing software applications. Work w/ DB2, VSAM, CICS, JCL, SQL, COBOL, COBOLII, Easytrieve, MS Access, Xpediter, Intertest, Changeman, Platinum tools for DB2, FileAid & project planning w/ MS Project. Oversee project coordination & training of new employees. Assess design specifications to ensure they meet company standards & requirements. Prepare work plans, codes & unit test programs & verify test data. Perform systems analysis, tests, coordinate cross-function testing, monitor integration & alpha/beta testing & troubleshoot defects found. Must have Bachelor's degree in CS, Electronic & Communication Engineering or related field. Foreign degree equivalent accepted. Must have 5 yrs exp. in job offered or position w/ same duties. Send resume: jobs@ups.com or United Parcel Service, Job Code: admin, P.O. Box 833, Mahwah, NJ 07430. Attn: Julie Baum, Human Resources, M-3C-010.

SAP Systems Analyst wanted by dlrg in Westchester, IL for NYC work location. Req'd: Bach or US equiv in MIS, exp. w/reinsurance process + 3 yrs exp. w/SAP. Fax resume to L. Hesse, MSG Systems, Inc, Fax (708) 947-3360

Mgmt/Systms Anlysts reqd to upgrade MIS & reporg procedures, review comp system capabilities, prep workflow charts & diagrams, study & dvlp new info systems, prep tech reports & instruction manuals. Use Win 98/3.1, Win NT Server & Win NT Workstation, MS Excel, MS Access, MS Powerpoint, Netscape & Internet Explorer, Novell Netware O/S. Bach in Engg/Math/Sc/MIS/Busn Admn or equiv +6 mos exp. Respond to Rahul Rametra, ATEC Group, Inc., 69 Mall Dr., Commack, NY 11725.

Software Engineer-real-time embedded IP switching software. C/C++, 3/Layer 4 IP Service Switch, ATM & Packet over Sonet. MS degree or BS +5.

Test Engineer-IP test plan development, configure and troubleshoot multicast servers and clients, DNS, LDAP, DHCP, FTP, Layer 1 and Layer 2 protocols. MS Engineering or BS+5.

Send resume to: Ellacoya Networks, ATTN: Jamie Tremblay, 7 Henry Clay Drive, Merrimack, NH 03054

Responsible to lead and develop large-scale data Warehouse application using Sybase Adaptive Server Enterprise. Responsible for design & development of Internet application using PowerBuilder, PFC, Dynamic HTML and Javascript. To Provide technical design and consultation for online data replication and resolving problems using Sybase and SQL Remote. To manage a process of converting data from Object Oriented database to RDBMS. Responsible for Data Modeling, GUI Design, Functional and technical design, including code development for integrating contract administration in one seamless application using Powerbuilder and Oracle. Manage application development code review, unit test, system test and Documentation within a timeline. Must have Master's/Graduate degree with specialization in Computer Science and six months of training in RDBMS. The individual must have: 1.Experience in designing and developing large applications using RDBMS such as Oracle/Sybase and GUI's such as PowerBuilder. 2. Experience in PL/SQL. 3. Experience in three-tier architecture using the Internet. 4. Graduate level course in Computer system architecture, Data Management, Computer oriented Numerical and Statistical methods. 40 hours per week. Annual salary of $70,000. Qualified candidates please report or send two resumes to the Gwinnett Job Order # GA 7635775 GA Department of Labor, 1535 Atkinson Road, Lawrenceville, GA 30043-5601. Candidates must have proof of legal authority to work in the U.S.

Software Developer (NJ) dsgn, dvlp & deploy scaleable software components for mortgage industry using COM/DCOM, ATL, MTS, MSMQ, SOAP, XML; dvlp web-based electronic storing & retrieving syst to store mortgage docs, dsgn credit card authorization or Payment Tech syst; dvlp socket-based programs; dsgn GUI objects w. OCX controls, ATL, ActiveX & other COM based techs. Reqts: comp-rel master and 2 yrs. work exp. Resume to: Collie Brown, Mortgage Systems, One Paragon Dr., #200, Montvale, NJ 07645.

Software Developer (Atlanta, GA) Research, design, develop, implement and test computer software in a client server environment, utilizing OOA, OOD and Java. Translate application requirements and use cases into problem-domain object oriented work products, identify objects. Develop analysis work products, including scenario/sequence diagrams. Translate, transform and implement design work products into source code. Provide technical support as required. Must have a Master's Degree or foreign degree equivalent in Computer Science or related field OR will accept Bachelor's degree and 2 years of experience as a Software Developer in lieu of Master's Degree. Educational/work background must include: (i) and year of experience using OOA and OOD in a client/server environment; and (ii) and year of experience with C++ in a Unix OR Windows NT environment. Experience may have been obtained concurrently. Must have legal authority to work in the U.S. Send resume to: N. Srinivasan-Pega, 51 Corp. 3500 Lenox Road, Suite 200., Atlanta, GA 30326

Technical Writer. Document all technical aspects of the client's software in development. Access the source code and pick up code extracts that help build the objects libraries, interfaces, and properties for the various software components. Describe and document code extracts. Document procedures on how to develop and implement code extracts. Interact with the development team to ensure the most up to date documentation of the software product. Must have BS or equiv. in CS or related field and 18 mos. exp. in above pos or 18 mos. exp. as a Technical Writer or related position able to use Oracle, MS Word, MS PowerPoint, SQL Server, ASP and HTML.

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Several computer related positions for large telecommunications consulting services company. Send resume to: Tangela Burks, Sema, 6 Concourse Pkwy., Suite 2700, Atlanta, GA 30328.

SAP Data Conversion Engineer: Design and Development of SAP computer software systems and data conversion. Required: BS in Computer Science and/or Math or Electrical Engineering or related, and certification in SAP R/3 Controlling Track. No Phone Calls. Resumes forwarded to: P.W. Kennedy, BackOffice Associates, Inc. P. O. Box 1215, Orleans, MA 02653 or fax to 508-255-2707.

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Computer
Large apparel co. seeks the following:

Database Administrator: Design, develop, administer and maintain Internet Data Warehouse (IDW) and Cognos Business Intelligence, develop front and Java Script, HTML and DHTML programs for the At.com web store and supporting applications. Reqs: BA in Comp Sc or Comp Eng, 3 yrs exp.

Manager Application Development: Design and Architect the Internet applications based on business requirements, develop the applications using InterWorld Commerce Exchange Technology, C++ and Java, develop the Coding Standards. Reqs: BA or equiv in Comp Eng, 5 yrs exp.

Send resume to: Ann Taylor, Attn: HR, 1372 Broadway, Dept. IT NYC 10018. EOE.

Sr. Web Developer. First Union/Wachovia Corp. Charlotte, NC. Design & develop internet appls., COM/DCOM components for projects, databases & packages for importing & exporting data from different platforms. Reqs: BA or foreign equiv in Computer Science, Eng, or a rel. disc. & 5 yrs exp. in the pos. off or as a System Architect/Designer or Database Designer. The 5 yrs reqd. exp. must have incl work w/ web application dvlp using VB, DCOM, SQL Database design, replication package creation, HTML authoring & batch file scripting. 40hrs/wk, M-F. Send resume & cvr. ltr. to Sabrina Miller, 1525 West W.T. Harris Blvd., NC 0775, Charlotte, NC 28288-0775.

Technical Associate sought by company in Boulder, CO specializing in software development to work in Boulder & other unanticipated job sites in the US. Develop courses & curriculum regarding Java, other programming languages, & web technologies for clients who utilize the technology. Design course exercises & develop software for courses as needed. Complete curriculum research, & update & modify courses. Develop presentations & course instruction. Provide course instruction to clients. Coordinate training of courses including installation & set up of courseware. Requires Bachelor's or foreign equivalent in Computer Science or related field, 6 mos. developing courseware software and writing curriculum for computer technologies. 8am-5pm, M-F. $60,000/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment Employment & Training Division, Tower II #400 1515 Arapahoe, Denver, CO 80202 & refer to Job Order Number CO80079908.

Programmer

Jr Programmer Assist programmers in design, development & maintenance of custom Software & interface for Telxon handheld computer using C , VB & MS Access. Identify software for updates. Req: Bachelors Degree in Computer Science. 40-hr. wk. Job/Interview Site: Tustin, CA. Please send resume to: DataCode Inc., PO Box 965 Tustin, CA 92781

CSWL, Inc. dba California Software Laboratories, a leading provider of quality software solutions to prominent businesses, is currently seeking candidates who will perform design, development & implementation of software products using object oriented methodologies and Internet technologies. Must have a Bachelors degree in Computer Science or any field of engineering. Mail or fax resume to: Attn: Director (HR), CSWL, Inc., 6800 Koll Center Pkwy, Suite 100, Pleasanton, CA 94566

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NE Ohio Ins. Co. seeks Programmer Analyst/PL-III to analyze user reqmts/procedures/problems to improve processing of comp system; confer w/personnel/analyze current operational procedures/ identify probs/learn specific input/ output reqmts; review comp system capabilities to modify prgms, eval effectiveness of prgm; troubleshoot; formulate plan using structured analysis/ feasibility costs/time req'd/compatibility of software/hardware; modify/create prgms from detailed specs. Bach in Comp Sci/Eng'g or equiv. based on a cred. eval. Min. 2 yrs. exp. in job or job-related. Exp. must incl COBOL, CICS, DB2, VSAM, JCL, VISIO, XPEDITER/CICS, XPEDITER/TSO, QMF & TSO/ISPF. Resumes to Progressive Insurance, SCB-HB1, 300 N. Commons Blvd., OH763, Mayfield Village, OH 44143. No calls. EOE.

System Developers needed. Positions available for qualified candidates possessing MS/BS or equivalent and relevant work experience. Duties include designing and developing software solutions. Monitoring and evaluating systems. Work with 2 of the following: RPG/400, CL/400 and SQL/400. Send resume to: D.R. Horton, Inc., 1901 Ascension Blvd. Suite 100, Arlington, TX 76006. Please reference CODEIX2 upon receipt to identify the position. No phone calls accepted.

IT Professionals

Entergy, one of America's largest utility companies has multiple openings for the following occupations in multiple locations.

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- Software Engineers

For immediate consideration, please forward your resume and salary requirements to Entergy Corporation and operating subsidiaries. Attn: Ms. Lori Hendler, HR Department, PO Box 61000, New Orleans, LA 70161. Phone: 504-576-4117. EOE/M/F/D/V. Principals only. You will only be contacted if you are considered for an interview.

IT Leader 2/Desktop Engineering Team Lead. First Union/Wachovia Corp. Position in Charlotte, NC. Manage engineers who design & implement solutions to enhance the desktop envir. Min. reqs. incl. BA or foreign equiv. in Comp. Science, Systems Eng. or rel. disc. & 5 yrs. exp. in the pos. off. or as Operations Mgr. or System Architect. The 5 yrs. reqd. exp. must incl. work supervising the eng. of large PC deployments (1000 or more PC's) as well as work w/ the architectural design of PC implementations across disperse locations using Microsoft tech. incl. Windows NT, SQL Server Admin (Transact-SQL), Windows scripting, & network tech. such as OSPF, RIP, TCP/IP & NetBIOS & server performance tuning. 2 yrs. of reqd. exp. must incl. work w/SMS, VB dvlp. & Object-oriented design & dvlp. using COM. 40hrs/wk, M-F. Send resume & cvr ltr to Johnna Fary, 301 South Tryon Street, 4th Floor, Charlotte, NC 28288-0953

Senior Business Analyst. First Union/Wachovia Corp Baltimore, MD. Implement SEC/NASDAQ/NYSE requirements for Equity Credit Market (ECM) trading (OTC and Listed). Oversee trading appl. & vendor support. Reqs: BA in MIS or Computer Science and 2 yrs. exp. in the pos. off. or as a Trading Floor Support Analyst or Computer System Support Analyst. The 2 yrs. of reqd. exp. must incl. work w/ trading floor tech. support, trading system appl. implementations, branch built coordination, budget submissions on system implementations & modification & upgrade of trading systems infrastructure. 40hrs/wk, M-F. Send resume & cvr ltr to Sabrina Miller, 1525 West W.T. Harris Blvd., NC 0775, Charlotte, NC 28288-0775

Usability Specialist Res. for designing a prevention guidelines site blueprint & creating the appropriate info. arch. Collaborate e-other CDC org. to update & improve access & use of CDC Guidelines. M.S. in Human Computer Interaction & abil. to do following, gained through & mos. exp. or 1 col. course: task analysis, usability testing, heuristic evaluation, prototyping, research design, web design. Abil. to use Java, HTML, CSS, & JavaScript. 40.0 hr/wk, 9:00 - 5:00. Send resume to: Mr. Arthur Jackson, VP Management Assistance Corporation, 2900 Chamblee Tucker Road, Building 10, Atlanta, GA 30341

Telecomm Co seeks Software Engineer for Chicago, IL location. Must possess Bach. degree in Comp Sci/Comp Eng, or Electrical Eng + 3 yrs exp in job offered or 3 yrs as Systems Analyst or Programmer Analyst. Send resumes to WFI, 4810 Eastgate Mall, San Diego, CA 92121, Attn: Itim resume@wfinet.com

Syst Analyst (Oakbrook, IL) Analyze user req'ments, develop project process flow, progr specifications, tests & conversion plans. Implement syst, train users. Plan & prep tech reports/memoranda. MS in Comp Sci/Engr/Math & 1.5 yr exp req'd. Exp must incl IBM mainframe, Xpediter, CA Realia Workbench, DB2, XDB, REXX, CICS, IMS DB/DC. $78,803/yr, 40 hrs/wk, 9a-5p. Applcts must show proof of legal authority to work in US. Resume to: IL Dept of Empl Security, 401 South State St - 7 North, Chicago, IL 60605, Attn: B. Kelly, Ref #V-IL 29311-K. An employer paid ad. NO CALLS - Send 2 copies of both res & cvr ltr

Senior Software Engineer wanted. Must have Bachelor's degree in Computer Science, Engineering or related field & 5 yrs. computer software development exper., incl exper with C++, Solaris and Object Oriented design. Send resume to Leo Charbonneau, CFO, Pactolus Communication Software, Inc., 69 Milk St., Westborough, MA 01581

Software Engineer- Web Development. Minimum qualifications include BS in Computer Science or Engineering, plus proficiency with MFC using MS-Visual Studio, Visual FoxPro programming and Web and Server Side programming with Cold Fusion and ASP technologies. Send resume to: Human Resources, Call24, 196 Boston Ave, Suite 3150, Medford, MA 02155

Shareholder.com is seeking a qualified Client Engineer to develop and maintain Cold Fusion web application on the internet and to work with our clients to define new strategic projects. Must have experience in real Cold Fusion and SQL programming. Send Resume to: Keith Barrett, Shareholder.com, 12 Clock Tower Place, Maynard, MA 01754.

Software Engineer

Design, implement, test and debug code per design specifications and problem reports using C/C++ and Assembly languages with object-oriented programming techniques and algorithms. Must have MS in CS, EE or related field and 1 yr exp in design and implementation of software features. Send 2 resumes to: Yvette Wischinski, Human Resource Representative, Andover Controls Corporation, 300 Brickstone Square, Andover, MA 01810

Software Engineer sought by an elevator manufacturer. Must have Bachelors in Comp. Sci or any Engg. 2 yrs. exp. in dsgn. dev of Network Manager System 2000 elevator control system. Respond to H.R., #SJ, Otis Elevator Co. 5 Farm Springs, Farmington, CT 06032

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Technical Sales Engineer. Resp. for Actix Analyzer software products domestically & internationally; product demonstration/training/technical services. Devel. technical proposals. Apply exp/knowledge of RF test & measurement tools/processes & cellular/wireless engineering environ. & systems. Travel within N. Am. & internationally req. FT. 2yrs. exp. & BS in Eng. req. Resume to: Actix Inc., Attn: Ms. Albers (TSE-CW), 1516 Anderson Road, Ste. 109, McLean, VA 22102.

Programmer Analyst - Req: B.S. in Comp Sci, MIS, Engg, Math or Tech, 2 yrs exp in job offered or as Programmer Syst Analyst, Consultant, Software Engrs. Exp must involve: SQL, JSPs, XML, UML & MS-Access. 40 hr/wk. Fax resume to Dr. A. Arora at 716-504-4548.

Sr. Systems Analyst/Programmers-Sensormatic Electronics Corporation, Boca Raton, Florida, has multiple openings for Sr. Systems Analyst/Programmers to work with an ERP support BaaN ERP software and sub-systems. Candidates must present a Bachelors degree in Computer Science, Information Science, Information Systems or Computer Engineering (software emphasis) or related field and 2-3 years experience using BaaN IV. Please apply directly through www.sensormatic.com (employment) by location and reference Job Code AZA1 or send resume and salary requirements to Staffing Department, B-76 at Sensormatic, PO Box 5037, Boca Raton, Florida 33431-0837. We are proud to be an EEO/AA employer M/F/V/D.

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Educational Testing Service ("ETS") is America's largest private educational measurement institution and a world renowned leader in educational research. ETS develops, administers, conducts and reports scores for a wide variety of achievement, occupational and admissions tests. ETS Princeton, NJ office is seeking experienced candidates to fill the following positions:

- Senior Software Systems Engineer: Bachelor's, software systems development within a Windows environment, update and query of Oracle databases using native Oracles calls; performance of object oriented design, and generation of C, C++, and 16-bit Windows SDK programs using Visual C++ 1.52.
- Assistant Research Data Analyst: Bachelor's statistical data analysis using SAS, FORTRAN and PARSCALE, scaling and equating of test data utilizing IRT and application of logistic regression analysis.

Apply with resume to: Ms. Kelly Abernathy, Porch Educational Testing Service, Rosedale Road, Princeton, NJ 08541.

PeopleSoft Technical Manager. Job location: Herndon, VA. Duties: Manage the set-up & implem. of PeopleSoft appls. Provide UNIX admin., DBA support & Appl. for the install, config. & on-going tech. support of PeopleSoft HRMS environ. using PeopleSoft proprietary toolsets, SQL, SQR & relational database. Provide planning exp. for the future develop. & enhancements of prod. environ. Resp. for planning the tech. architecture for procure., install. & config. of PeopleSoft HRMS develop., testing & prod. servers. Create eval. & manage project budgets & timeframes. Mentor consultants in div. Requires: M.S. in Comp. or Info. Sci., Eng. or related field & 3 yrs. exp. in the job offered or 3 yrs. exp. as a Software Eng. or Prog./Analyst. Concurrent exp. must incl. 3 yrs. exp. working with PeopleSoft HRMS environ. & 3 yrs. exp. using PeopleSoft prod. toolsets. EOE. 40 hrs./wk., 8:00 a.m. to 5:00 p.m. Send resume (no calls) to: Diane Tuccito, AnswerThink, Inc., 817 W. Peachtree St., Suite 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

Software Engineer. Duties: Plan, develop & implement the use of testing measurements for software releases using Java. Execute test case scenarios & test data for software fixes & enhancements using Java. Maintain test cases & expected results to be used for ongoing regression testing of system. Document test results & comm. w/developers on recommended enhancements. Requires: B.S. (or foreign equiv.) in Comp. or Info. Sci., Eng. or related field. Coursework must incl. class in comp. prog. EOE. 40 hrs./wk., 8:00 a.m. to 5:00 p.m. Send resume (no calls) to: Timothy Wers, CTG, Inc., 55 Public Sq., 5th Fl., Cleveland, OH 44113.

SAP Consultant – Plans/coordinates activities for client projects, ensures goals & objectives are met, analyzes factors or enhance productivity, determines time frame for client req; manages programmers as needed; provides tech. advice or systems implemtn. Bachelor's & Comp Sci, Engineering or related req'd plus 3 yrs exp in SAP req'd. Sal: DOE. Pls contact: Melisa Schwartz, CSIPER Consulting, 592 Baltimore Pike, Ste 204, Chadds Ford, PA 19317.

GLOBIX Corporation, is seeking to fill the following positions:

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Act a part of team responsible for management, security & operation of company infrastructure, using administrative languages (Perl, Bourne/Korn Shell), ISP related systems globally (DNS, SMTP, NNTP, etc.), major backend infrastructure systems, enterprise management systems/ applications, monitoring systems contained IT related systems, intranet servers. 3 years in the position req.

Senior System Administrator (UNIX)

Oversee activities of the entire team responsible for management, security & operation of company infrastructure. 4 years exp. required plus a B.A. Degree/ equivalent in Computer Science, Data Processing, Information Systems, Engineering.

Respond by resume to: HR Department, Globix Corporation, 139 Centre Street, New York, New York 10012.

Software Engineer. Duties: Analyze, design, develop & implement software appls. using Oracle Design, implement, test & troubleshoot software modules. Resp. for system monitoring, report design & maint. admin. guidelines. Requires: M.S. in Comp. or Info. Sci., Eng. or related field & 3 yrs. exp. in the job offered or 3 yrs. exp. as a Database Admin., Prog/Analyst or Prog. Will accept B.S. (or foreign equiv.) & 5 yrs. prog. exp. in the comp. ind. Concurrent exp. must incl. 3 yrs. exp. designing, developing & implementing software appls. using Oracle. EOE. 40 hrs./wk., 8:00 a.m. to 5:00 p.m. Send resume (no calls) to: Mel Nadtiller, CTG, Inc., 75 Pineview Dr., Suite G, Amherst, NY 14228-2121.

LEAD PROGRAMMER/ANALYST (Columbia, SC) to design, develop, implement, integrate and support computer software for agricultural bank loan applications using C/C++, Visual Basic, Visual C++, Object Oriented design, COM, Multi-tiered Architecture, Data Modeling, SQL, Stored Procedures, MTS or COM+ and SQL Server 2000 on Windows 98/NT/2000. Req. Bach. degree (or foreign equivalent) in Computer Science, Electrical Engineering or a closely related field, with 2 yrs. exp. in the job offered or as a Programmer/Systems Analyst. Exp. must include 2 years using C/C++. Competitive salary and benefits. 8-5, M-F. Send resume or Recruiter: AgFirst Farm Credit Bank, PO Box 1499, Columbia, SC 29202. Attn: Job BS - (No Phone Calls Please).

ENGINEERING

Peco, Inc., an innovator of wireless phone software is seeking candidates for the following positions in our San Jose location:

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Senior Software Engineer (Req. #147)
Software Test Engineer (Req. #143)
User Interaction Designer (Req. #146)
Team Lead/Deployment Services (Req. #148)
Director of Business Development, Europe (Req. #150)

For immediate consideration, please forward your resume with Req. # via email to: jobs@peco.com or fax to: 800-525-9126. We are an Equal Opportunity Employer.

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Contact the Corporate Headquarters for positions available in the following areas: Atlanta, Chicago, Connecticut, Denver, Florida, Massachusetts, New Jersey, New York, North Carolina, Pennsylvania, Phoenix, Southern California, Texas, Virginia/DC.

For consideration please reference Job Code: PIRCW06 and send your resume to: RCG Information Technology, Attn: Natalie Reveiling, 379 Thornall Street, Edison, NJ 08837. FAX: (732) 744-3583 or email to: recruit@rcgit.com. We are an Equal Opportunity Employer. M/F/D/V.

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System Analyst: Design, develop, integrate, test & implement multiplatform software based solutions & sup. automated prod. Systems. Interface w/clients, sup. prod. Mngrs or supervisors to define & doc. Business req. Id. analysis & def. of req. into functional design specifications. Design, develop & main. prg. in accordance w/established guidelines and standards. Analyze & resolve prod. processing problems. Works w/ Windows NT Terminal Server (CITRIX) admin & configuration, ARC SERVE (for system backups & recovery), Util. software develop. for BULK e-mail generation (SMTP), ATM, POS Claim/Track, Project Management Tool for Timing & Control, Foreign Trade Zone Inventory & Billing appl. Tandem Systems: TAL/COBOL, Performance & Tuning (MEASURE), FUP, PUP, TACL, ENFORM, INSPECT, Non-Stop SQL. Works w/ ACI Performance Utilities, EMSPerus, BIC ISO, XPNET. 40 hrs per wk. 9A-6P. 2 yrs exp in job offered. Fax resume to: (305) 667 9401.

Interactive Marketing Consultant. Job location: Torrance, CA. Duties: Create, update & maintain web appls. using Windows NT & UNIX Register COM objects in MTS. Create tables, windexes & create foreign keys. Write scripts & templates using ASP, PHP, Perl & Java. Requires: B.S. in Comp or Info. Sci., Eng. or related field. Coursework must incl. classes in Oper. Systems, Software Eng. & UNIX. EOE. 40 hrs./wk., 8:00 a.m. or 5:00 p.m. Send resume (no calls) to: Diane Tuccito, AnswerThink, Inc., 817 W. Peachtree St., Suite 800, Atlanta, GA 30308. Must have legal auth. to work in U.S.

Software Engineer and Senior Software Engineer consulting positions to develop, create, and modify computer systems and applications software and specialized utility programs. Analyze and design databases within an application area. Analyze user needs and develop software solutions. Must travel and relocate frequently. 3 or 4 year Bachelor's or Master's degree or foreign equivalent is required in one of several limited fields: Computer Science/Applications, Engineering, Chemistry, Math, Physics, or scientific or business related field. 1+ two of Master's degree. Bachelor's degree or foreign equivalent with five years of progressive experience as a computer professional will be accepted. Some positions require one year of experience in the job offered or as a computer professional. Candidates must have one year of experience in a particular skill set: CRM: Siebel, Clarify, Oracle CRM, SAP CRM, ERP: PeopleSoft, SAP, Baan, J.D. Edwards, Oracle Applications/ Financials/ Manufacturing/HR; GUI: Windows 95/98/00, Windows NT, Unix, Oracle, Visual Basic, Visual C++, C, C++, Visual Basic, PowerBuilder, MFC, Crystal Reports, COM/DCOM, CORBA, Internet Applications: ASP, HTML, Java Script, Java, Coldfusion, Broadvision, ATG Dynamo, Netdynamics, Websphere, Java Beans, Front page, CGI; Perl; MTS; IIS; Mainframe: IBM/360, IBM ES/900, MVS, IMS, CL/400, CICS, TSO, VSAM, COBOL, JCL, AS/400, DB2, VAX/VMS; Oracle RDBMS, Designer 2000, Developer 2000, Oracle RDBMS, SQL*Plus, Pro*C, PL/SQL, SQL*Forms, SQL*Reports, SQL*Loader, Oracle Forms, Oracle Reports, SQL*Menu, SQL*DBA, SQL*Net; RDBMS: Informix, Oracle, FoxPro, Sybase, SQL Server, Progress; Unix/NT Administrations: RS/6000 Sun Sparc, Sun Ultra, SUN Enterprise, HP 9000, Logical Volume Manager, IBM RAID, SSA, TCP/IP, SUN CLUSTER, HIGH Availability, SUN RAID, VeritasVolume Manager, NIS, NIS+, NFS, MC Service Guard, HP Openview, Linux, FreeBSD, GNU. Please submit resumes with cover letter specifying position of consideration, to: RapidSpec, Immigration Section, code# 1125R, 4400 CampbellsRun Road, Pittsburgh, PA 15205.

Senior Software Engineer. Resp. for architecting and developing application of virtual machine technology for scalable resource management. Duties include: designing and implementing software that provides resource management for server products, and publishing results. Reqs: Ph.D. in CS and 3 yrs. exprn. research or development of software. Doctoral focus and exp. must be in application of virtual machine technology for scalable resource management. C/C++, UNIX. Salary: DOE. Send resume or www.sym@vmware.com or HR, 3145 Porter Dr., Bldg. F, Palo Alto, CA 94304.

SOFTWARE ENGINEER to lead a team in the design, development, testing and maintenance of application software using COBOL, DB2, Easytrieve, IMS, JCL, HTML, Natural and Adabas in a mainframe environment. Supervise and mentor junior programmers and engineers. Require: Bachelor's degree in Computer Science/Engineering, or a closely related field with five years of progressively responsible experience in the job offered or in the related occupation of Systems Analyst or Programmer. Extensive travel on assignment to various client sites within the U.S. is required. Competitive salary offered. Apply by resume to: Maria Jaffe, Recruiting Mgr., SE, Global Software Development Services, Inc., 1110 Northchase Parkway, Suite 250, Marietta, GA 30067. Attn: Job RC.

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– *Lee Copeland*

Corrections

A sidebar that ran as part of the Nov. 12 "E-Mail@30" feature stated that Bolt Beranek and Newman Corp. is now Genuity Inc. Much of BBN's operations did become part of Genuity, but Ray Tomlinson, the originator of the e-mail address format, works at BBN Technologies, which is a subsidiary of Verizon Communications.

The date of a previous column by David Foote that was alluded to in his Nov. 5 column ("Seizing Success from the Jaws of Tragedy") was misstated. The correct date is Sept. 11, 2000.

In "Software Knows When to Tell a Secret" in the Nov. 5 issue, the description of the problem that Penn Mutual Life Insurance Co. was trying to solve was incorrect. The problem was not that users couldn't change their own passwords, but that they couldn't reset the passwords for expired or locked-out accounts.

The business profiled in the Nov. 5 Workstyles column was incorrectly identified as MSNBC. It actually was the company's MSNBC.com online news service.

The Nov. 5 Security Manager's Journal gave a mistaken impression of how much experience is considered necessary to pass the Certified Information Systems Security Professional exam. The group that offers the test says candidates should have a working knowledge of all 10 subject areas and at least three years of cumulative experience in one or more of the areas.

In the Oct. 1 issue, "The DA's Office Goes Digital" listed the wrong vendor for database software used by the district attorney in Queens County, N.Y. The office's case records are stored in the Cache database made by InterSystems Corp. in Cambridge, Mass.

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FRANK HAYES/FRANKLY SPEAKING

Tablet Watch 2001

THE BIG COMDEX GADGET STORY THIS YEAR? No question, it's the Tablet PC. IBM won't be making one, and Michael Dell doesn't think there's a market for them. But Microsoft claims that inside five years, Tablet PCs will elbow aside traditional laptops and even desktop machines to become the most popular form of PC.

That's, er, unlikely. Especially when you consider that Tablet PCs have been on the market pretty much continuously since 1989, and Microsoft has been pushing them, on and off, for most of that time.

But that doesn't mean we shouldn't be ready — just in case.

There's no way for corporate IT people to figure out whether Tablet PCs will actually take off this time. Microsoft's backing is no guarantee; Microsoft also backed PenWindows, Windows for Pen and the Pen PC. Hardware heavyweights don't carry much weight either: IBM, Toshiba and Fujitsu have all made Tablet PCs that never found more than a niche market. (In fact, you don't have to wait for next year — you can buy a Fujitsu Tablet PC today.)

We can't analyze the specifications and know for sure, because the specs just tell us what these gadgets are — not whether they'll be useful. We can't take analysts' bouquets or brickbats at face value, because *they* don't have any more production-level experience with these things than we do.

Fortunately, we don't have to figure it out. All we have to do is keep an eye on the *real* gadget experts: our users.

If lots of them buy these gizmos out of their own wallets, insist on dragging them into the office and keep using them for months — *that's* when we'll know they may be worth officially supporting.

If users never give the gizmos more than a yawn, we'll know Tablet PCs are still specialty items.

And if users start bringing them in, but they disappear after a month or two, we'll all breathe a sigh of relief. That means the Tablets looked better than they really worked — at least for the kinds of work our users do. And we won't have to spend a nickel of our own budgets to find that out.

That's the thing about users and gadgets — they *will* try them out. Ever since users started smuggling in Apple IIs with Visicalc spreadsheet software on them, they've been causing us grief with nonstandard, unapproved technology.

But they're also the best judges of whether the gadgets help them do their jobs better. And they're ruthless about making those decisions. After all, when you're an unauthorized gadget user, that gadget better be worth the risk.

More to the point, they'll sometimes give a thumbs-up to stuff we'd never dare to force on them.

Case in point: the Palm Pilot. When it first showed up, IT people knew it was a dandy gizmo. But it was tiny and tough to read. And its weird system of sort-of-recognizing-something-kind-of-like-handwriting was hard to learn, error-prone and pretty geeky. Any IT shop that tried to force it on users would face open revolt.

Who knew users would snap up Palms on their own, teach themselves how to use them and then demand IT shops to support them? Answer: Nobody — not even the users themselves, until they actually did it.

Best of all, letting users figure out which gadgets are useful makes the users happy. They get more control over that IT decision, and they get to tell *us* what to do for a change.

So watch your users carefully as Tablet PCs and other high-tech widgets arrive. It's the cheapest and most accurate way of finding out whether these products have potential in your business.

And on the outside chance that users find this new batch of Tablets to be more useful than they have since 1989 — well, this way you'll be ready.

Just in case. ◗

FRANK HAYES, *Computerworld*'s senior news columnist, has covered IT for more than 20 years. Contact him at frank_hayes@computerworld.com.

SHARK TANK

IT PILOT FISH and co-worker are mystified when their printouts don't show up in the hopper of the departmental printer. They run the jobs again – no luck. Finally, fish suggests pushing the large green button on the printer. Co-worker says, "There's not supposed to be a large green button on this printer." Turns out that equipment was moved the night before, fish admits – and they're waiting for their print jobs at a copy machine.

MY FLOPPY DISK drive is going bad, user says – "It keeps making a grinding noise." Help desk pilot fish sees the problem immediately: The disk is hanging halfway out of the drive. Why? fish asks. "I didn't want to put it all the way in," answers user, "because what if I wanted to get it back out?"

COMPLAINTS OF SLOW mainframe response times are flooding the help desk. So pilot fish asks mainframe operator what the problem is. "It is *not* running slow," he answers defensively. "It's just very busy."

YOU HAVE TO MOVE our printer away from the window, admin assistant tells IT pilot fish – it gets too much cold air. How do you know? fish asks. Every time we print, we have to wait for it to warm up, she replies. "I turned off the 'power save' feature," fish says, "and it has stayed warm enough ever since."

SALESMAN is demonstrating Web-based software to customer's management group. Why squint at a tiny laptop screen? says boss. He tells pilot fish to hook it up to a projector. Salesman fires up Web browser, and onto the big screen flashes page after page of dirty pictures until fish vaults the desk and pulls the plug. My home page must have, um, accidentally got set to a porn site, stammers salesman. Suggests fish, "Not the demo he wanted to show."

Show me *your* stuff: **sharky@computerworld.com.** You get a snappy Shark shirt if your true tale of IT life sees print – or if it shows up in the daily feed at *computerworld.com/sharky.*

The 5th Wave

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"Look into my Web site, Ms. Carruthers. Look deep into its rotating, nicely animated spiral, spinning, spinning, pulling you in, deeper... deeper..."

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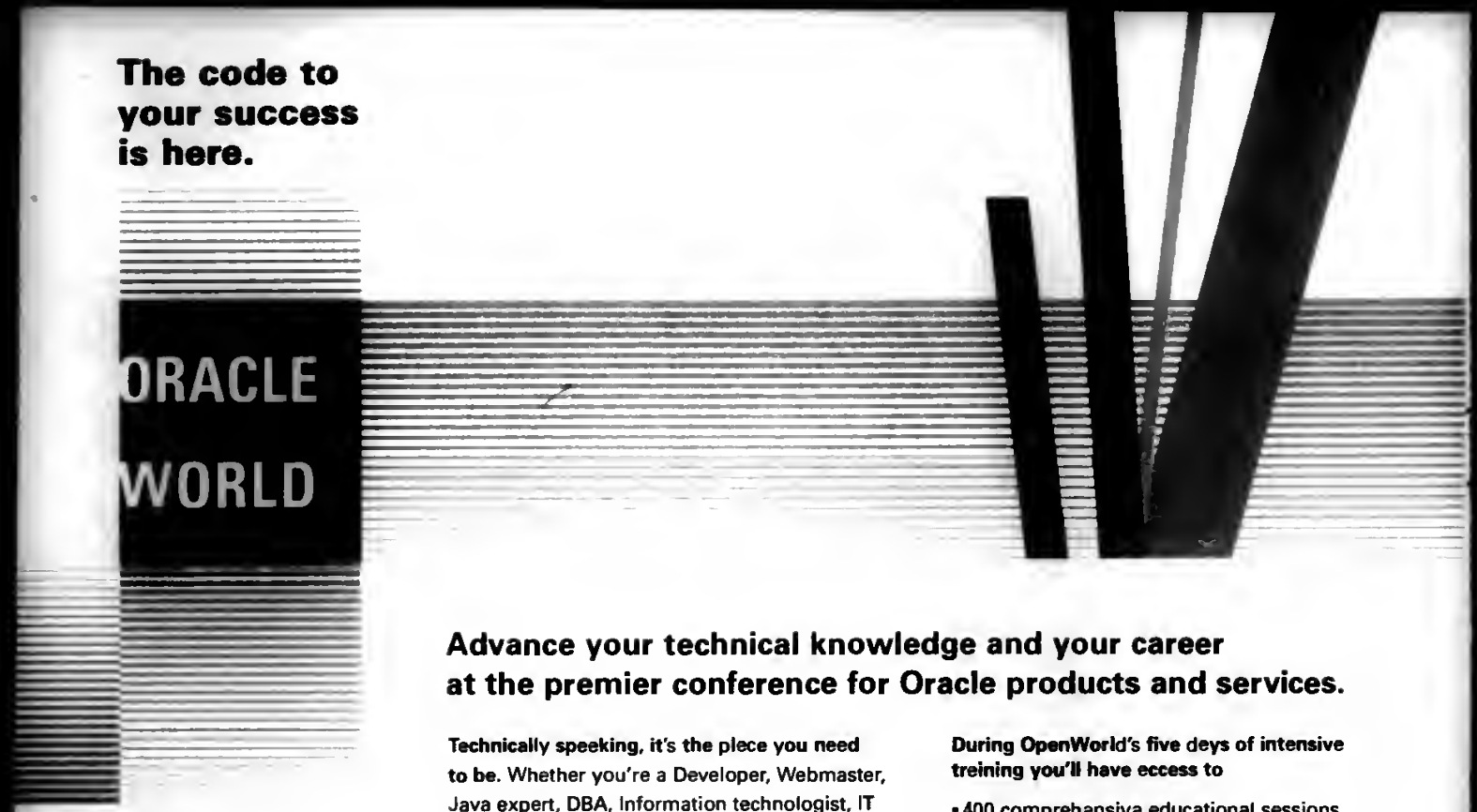

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